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FOREWORD

In support of the NASA (MAR) Apollo Reliability and Quality Office, this compilation of the probability of crew members correctly performing defined tasks has been proposed under Contract NASw-410, Work Statement Paragraph C.4.3.1.2. The objective of this compilation is to provide a basis for analysis and evaluation of crew performance accuracy for tasks defined in the Apollo Design Reference Mission II using the best available data (American Institute for Research "An Index of Electronic Equipment Operability-Data Store", document AIR-C43-1/62-RP(1)). Included in the compilation is a comparison of Apollo Design Reference Mission II tasks with selected tasks performed at the Martin Company, Baltimore, during manned space flight simulation studies.

INTRODUCTION

In evaluating the success and safety aspects of manned-space flight vehicles, including estimates of parts reliability, the state-of-the-art technology of systems analysis has progressed to a high degree of capability. Part, subsystem, and system qualification tests have been accepted as pre-flight requirements. Computerized programs which determine the effects of failures in any system by use of data derived from Apollo or industry test programs have saved considerable time and effort.

The ability of human crews to operate or monitor the increasingly complex systems has not been analyzed or measured to the extent to which the systems have. Since the crew is half of the man-machine system, a need exists to evolve techniques for developing and applying crew performance data to existing subsystem performance data to "close the loop". An additional need exists in orienting crew training programs toward assuring crew proficiency in performing both the nominal mission tasks and those tasks necessary to continue the mission or complete a safe abort in event of equipment malfunction.

To obtain quantitative performance assessments for crew tasks performed during a nominal Apollo Lunar Mission, this study considers man as a subsystem that possesses a failure rate affected by the parameters of stimulus and response, quite similar to the environmental parameters affecting failure rates of systems. A comprehensive search of state-of-the-art crew performance literature disclosed several sources of data pertinent to Apollo crew operations. The present compilation is a selection of probability values from the American Institute for Research data. It shows the estimated probability of correct completion of crew tasks specified for Design Reference Mission II. It provides a needed base-line and a rational starting point for systematic analysis of Apollo flight operations.

APPROACH

Recognizing the need for a compilation of basic crew performance data to analyze and compare tasks within the Apollo program, NASA Headquarters initiated work to obtain these data.

A comprehensive search of available literature was undertaken. The results of this search disclosed a minimum of theoretical and experimental data of sufficient scope to permit application of these data to current Apollo spacecraft task definitions.

Conferences were held with recognized experts in the field of crew operations and human factors at research centers active in these fields. These visits further amplified the need for a comprehensive, coordinated effort in this field.

All collected literature was evaluated to determine its application to crew tasks as defined in the Design Reference Mission II. This evaluation lead to the selection of the data collected by the American Institute for Research (AIR) as best meeting the objectives of providing an initial data base.

The published results of the Martin-Baltimore simulation of a manned lunar mission were compiled to permit direct comparison with the tasks definition contained in the DRM-II.

The AIR data were used as a data bank to compile a basic set of estimates of the probability of correctly completing a defined DRM-II task on the first try by a crew member. The format of the compilation is designed to provide for the addition of supplemental or up-dated values. It presents the AIR data at the individual task level and the Martin-Baltimore data at the level of a major task event.

This compilation is limited to coverage of the command/service module crew task operations; it will be supplemented by data for LEM crew task data.

Limitations of the AIR data are significant and are listed below:

- (1) The consequences of specific components and parameters in interaction are unknown.
- (2) The AIR data index is derived from data from simulated tests rather than actual use.
- (3) The index is intended for predicting performance by relatively unselected personnel who have received only nominal training.
- (4) The index makes no allowance for the many variables that tend to affect human performance such as fatigue and task load.

The objective of this compilation of data is to provide a well-defined set of the best available information for the systematic analysis and study of Apollo operations. By coordinating the use of these data in conjunction with equipment information, comparative evaluations of task schedules, system mechanizations, and operating procedures can be accomplished in a logical orderly manner.

The ultimate goal in publishing this compilation is to provide a basis for initial evaluation of the man-machine system. A logical sequence will be to develop procedures for the integration of these data into the complex structures of mission operations, mission rules, flight readiness reviews, and mission objective accomplishment.

DISCUSSION

Analysis of manned systems operational crew performance reliability is incomplete without a determination of the effect of crew performance on the equipment. Various systems, by the nature of their function in the mission, are more critical to mission success and crew safety than others. Each crew task was analyzed by subsystem engineers utilizing failure mode effect analyses, system interfaces, and other evaluation criteria.

Based on a thorough review by subsystem engineers, crew task performance criticality numbers have been evaluated as follows:

- 1) Error will cause catastrophic failure.
- 2) Error will cause subsequent system degradation and result in mission abort.
- 3) Error will cause insignificant or no degradation of system and will permit mission to continue.

APPLICATION OF AIR DATA TO DRM-II CREW TASKS

To establish estimates of reliability in performing a given crew task, it is first necessary to divide the function into three parts:

- 1) Input or stimulus which initiates the response. The stimulus may come from an indicator such as a light, scope, or meter; from an informational job aid such as a manual or check list; from what the operator "knows" must be done; or from successful completion of the preceding step.
- 2) Mediating process or thinking which is required between receiving the input and making the proper response. This mediating process may be virtually automatic, fairly simple, such as comparing two

numerical inputs, or quite complex, such as evaluating threats.

- 3) Output or response which is the observable part of the behavior and may involve such things as verbal communication, writing, or activating a control.

The index is based on the independent assessment of the operator reliability associated with each of these three aspects of input, mediating process, and output for each response. Since reliability is a function of certain characteristics of each of the three aspects of behavior, relevant categories of characteristics for each aspect of behavior are presented in the AIR index. The evaluation, therefore, consists in determining the characteristics relevant to a particular step of behavior being analyzed and then matching these characteristics with those contained in the AIR index.

For a typical DRM-II task the evaluation is applied as follows:

TOGGLE SWITCH ACTIVATION

Task Characteristics

Input (Labeling)

Span - 3 to 5 words	.9995
Legibility - clear and concise	.9999
Printing height - 1/5" or more	.9997
TOTAL	<u>.9991</u>

Mediating Process

Homogeneous discrimination	.9987
TOTAL	<u>.9987</u>

Output (Toggle Switch)

Size - regular	.9999
Resistance - soft	.9999
Number of positions - three	.9991
Throw direction - vertical	.9999
Angle of throw - 40°	.9998
Number in group - single row of 6 to 10	.9996
Distance between centers - 1" or more	.9999
Number of position indications - two	.9999
TOTAL	<u>.9980</u>

$$\text{TOTAL TASK RELIABILITY} \quad .9991 \times .9987 \times .9980 = .9958$$

In many instances, a thorough analysis of the AIR data bank and comparison with the task definition as iterated in the Apollo DRM-II resulted in an inability to apply the AIR data bank to the specific task. In these instances, no data is listed in the AIR reliability column.

APPENDIX

EARTH ASCENT

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Rel	
1	DETERMINE THAT LIFTOFF HAS OCCURRED	C, N	II	000.00.00	2.1	CHECK LIFTOFF LIGHT	1.000	.9999	AEROJET-GEN	.8918	WILLIAMS	.97965		
2	DETERMINE POSITION OF FUEL CELL REACTANT VALVES	E	II	000.00.00	1.3	CHECK F/C REACTANTS	1.000	.9987						
3	DETERMINE POSITION OF FUEL CELL TO MAIN BUS CIRCUITRY SWITCHES	E	II	000.00.03	1.1	APPLY POWER TO FUEL CELL PUMP MOTORS	1.000	.9664						
4	SCAN DISPLAYS CRITICAL TO ASCENT TO EARTH ORBIT	C, N	II	000.00.03	1.8									
5	DETERMINE FUEL CELL 1 DC VOLTAGE AND AMPERAGE	E	III	000.00.06	1.11	CHECK F/C BUS DISCONNECT CAUTION	1.000	.9833						
6	DETERMINE BUS 1 PHASE A AC VOLTAGE	E	III	000.00.10										
7	DETERMINE TIME FROM EVENT	N	III	000.00.12	2.2	CHECK MISSION TIMER								
8	MONITOR FDAI	N	II	000.00.13	1.16D	FDIA ALIGN	.250	.9525						
9	COMMUNICATE REPORT TO MSFN START OF DOWN RANGE PITCH PROGRAM	N	III	000.00.13										
10	CHECK SPS PRESSURES AND TEMPERATURES	E	II	000.00.14	2.4	CHECK S-I FUEL TANK PRESS								
11	DETERMINE POSITION OF SPS HELIUM SOLENOID VALVES	I	II	000.00.20										
12	DEACTIVATE AUTOMATIC RCS OXIDIZER DUMP LOGIC CIRCUITRY	C	II	000.00.42	2.6	DISABLE AUTOMATIC OXID. DUMP								
13	REPORT AUTO OX DUMP DISABLED	N	III	000.00.44										
14	REPORT TRANSIT THROUGH REGION OF MAX DYNAMIC PRESSURE	N	III	000.01.24										
15	DETERMINE LAUNCH VEHICLE X AXIS COINCIDENCE WITH LAUNCH VEHICLE TRAJECTORY	C	II	000.01.29	2.5	CHECK PITCH OVER								
16	CHECK ALTITUDE ON ALTIMETER	C	III	000.01.42	1.18	CHECK ALTIMETER ON								
17	START COOLING IN SUIT HEAT EXCHANGER AND WATER GLYCOL EVAPORATOR	N	III	000.02.00										
18	DEACTIVATE EDS 2 ENGINES OUT ABORT CAPABILITY	C	II	000.02.25	2.11	DE ARM AUTO ABORT	.750	.9884						
19	REPORT TO MSFN LV RATES AND 2 ENG OUT AUTO ABORT CAPABILITY DISABLED	N	II	000.02.25										
20	DETERMINE S-IC ENGINE CUTOFF	C, N	II	000.02.35	2.12	CHECK S-I ENGINES CUTOFF	1.000	.9999						
21	DETERMINE S-IC SEPARATION	C, N	II	000.02.36	2.13	CHECK S-I SEPARATION								
					2.14	CHECK S-I FUEL PRESS								

EARTH ASCENT (CONTINUED)

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	No.	A.I.R. Rel	Source	Rel	Source	Rel	Rel	
22	DETERMINE S-II ENGINE IGNITION	C,N	II	000.02.36	2.15	CHECK S-II ENG IGNITION	1.000	.9999						
23	DETERMINE S-II FORWARD INTERSTAGE JETTISON	C,N	II	000.03.09				.9999						
24	ACTIVATE ALL SPS GIMBAL MOTORS	C	II	000.03.11				.9846						
25	PREPARE CM FOR SPS ABORT MODE	C	II	000.03.18				.9917						
26	PERFORM LES TOWER JETTISON OPERATIONS	C	II	000.03.23	2.16	JETTISON TOWER	1.000	.9992						
27	REPORT COMPLETION OF TOWER JETTISON OPERATIONS	N	III	000.03.29				.9983						
28	DETERMINE S-II ENGINE CUTOFF	C,N	II	000.08.56	2.17	CHECK S-II ENG SHUTDOWN	1.000	.9999						
29	DETERMINE S-II SEPARATION	C,N	II	000.08.56	2.18	CHECK S-II SEPARATION	1.000	.9999						
30	DETERMINE S-IVB IGNITION	C,N	II	000.08.57	2.20	CHECK S-IVB ENG IGNITION	1.000	.9999						

EARTH PARKING ORBIT

No.	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				
	Task	Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Page Ref
1	DETERMINE S-IVB ENGINE CUTOFF	C	II	000.11.23	2.21	CHECK S-IVB ENGINE SHUTDOWN		.9936					
2	REPORT S-IVB ENGINE SHUTDOWN	N	II	000.11.23				.9985					
3	MONITOR SC RATE STABILIZATION	C/N	II	000.11.28				.9999					
4	DETERMINE LIMIT CYCLE OFF	C/N	III	000.11.58				.9999					
5	CHECK POST INSERTION PARAMETER ON DSKY	C/N	III	000.11.59				.9999					
6	PERFORM ECS STATUS CHECK (6 THROUGH 19)	E	II	000.11.59	2.6	CHECK O ₂ AND H ₂ HEATERS		.9924					
7	CHECK SURGE TANK PRESSURE NORMAL	E	III	000.12.01				.9887					
8	CHECK OXYGEN FLOW NORMAL	E	III	000.12.03				.9846					
9	CHECK PGA COMPRESSOR DELTA P NORMAL	E	III	000.12.05				.9846					
10	CHECK EVAPORATOR STEAM PRESSURE NORMAL	E	III	000.12.07				.9846					
11	CHECK GLYCOL DISCHARGE PRESSURE NORMAL	E	III	000.12.09				.9846					
12	CHECK WASTE WATER QUANTITY NORMAL	E	III	000.12.09				.9846					
13	CHECK POTABLE WATER QUANTITY NORMAL	E	III	000.12.09				.9809					
14	CHECK ECS RADIATORS OUTLET TEMPERATURE NORMAL	E	III	000.12.11	2.4	OPEN SPACE RADIATOR VALVES		.9846					
15	CHECK GLYCOL EVAPORATOR OUTLET TEMPERATURE NORMAL	E	III	000.12.13	2.5	CHECK GLYCOL EVAPORATOR TEMPERATURE		.9846					
16	CHECK PGA TEMPERATURE NORMAL	E	III	000.12.15				.9959					
17	CHECK CABIN TEMPERATURE NORMAL	E	III	000.12.17				.9959					
18	CHECK PGA PRESSURE NORMAL	E	III	000.12.19				.9959					
19	CHECK CABIN PRESSURE NORMAL	E	III	000.12.21				.9959					
	CHECK SPS CONTROLS AND DISPLAYS <u>(20 THROUGH 26—EXCEPT 21,22)</u>												
20	CHECK SPS PRESSURES AND TEMPERATURES	E	II	000.12.23				.9848					
21	PREPARE MASTER ALARM SYSTEM FOR ORBITAL OPERATIONS	C	III	000.12.29				.9898					
22	PERFORM CAUTION/WARNING LAMP TEST	N	III	000.12.29	2.1	PERFORM LAMP TEST		.9973					
23	CHECK SPS ENGINE INJECTOR EVENT INDICATORS	E	II	000.12.30									
24	CHECK SPS PROPELLANT GAGING SUBSYSTEM	E	II	000.12.32				.9976					

EARTH PARKING ORBIT (CONTINUED)

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA			
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Page Ref
25	CHECK SPS PROPELLANT UTILIZATION SUBSYSTEM	E	II	000.12.34	2.9	CHECK SPS OXIDIZER UNBALANCE		.9882					
26	CHECK SPS HELIUM PRESSURE CONTROL SUBSYSTEM	E	II	000.12.36				.9964					
27	RECEIVE MSFN CONFIRMATION OF TRAJECTORY VIA VOICE	C	III	000.13.23				.9989					
28	RELEASE TORSO STRAPS FROM MAXIMUM RESTRAINT	C, N, E	III	000.13.33									
29	DEACTIVATE POWER TO BOTH TVC SUBSYSTEMS	C	II	000.13.43				.9920					
30	COMMUNICATE REQUEST FOR STATE VECTOR UPDATE TO MSFN	N	III	000.13.43				.9985					
31	DEACTIVATE INJECT PRE-VALVE	C	II	000.13.45				.9973					
32	RECEIVE CONFIRMATION FROM MSFN THAT UPDATE WILL BEGIN AT X MISSION TIME	N	III	000.13.45				.9989					
33	DEACTIVATE ALL SPS GIMBAL MOTORS	C	II	000.13.46	2.11	CHECK SPS GIMBAL ANGLES		.9868					
34	SELECT COAST-CMC UPDATE MAJOR MODE	N	III	000.13.47									
35	PROGRAM CMC	N	II	000.13.49				.9464					
36	SECURE ROTATIONAL CONTROLLER NR1	C	III	000.13.51									
37	DEACTIVATE MASTER EVENT SEQUENCE CONTROLLER	C	II	000.13.53				.9876					
38	CHECK DSKY UPTL ACTIVITY LIGHT ON	N	III	000.14.11				.9954					
39	MONITOR MDC CGC DURING STATE VECTOR UPDATE	N	II	000.14.13				.9922					
40	DETERMINE ALTERNATING CURRENT VOLTAGE PARAMETERS	E	II	000.14.24				.9866					
41	DEACTIVATE AC INVERTER 2	E	III	000.14.38	2.8	CHECK INVERTERS		.9969					
42	DEACTIVATE AC INVERTER 3	E	III	000.14.44	2.8	CHECK INVERTERS		.9960					
43	CHECK DSKY UPTL ACTIVITY LIGHT OFF	N	III	000.14.50				.9954					
44	DISCONNECT BATTERIES A&C FROM MAIN DC BUSSES	E	III	000.14.51				.9969					
45	CHECK DSKY PROGRAM INDICATOR FOR CHANGE TO CMC IDLING MM CODE	N	II	000.14.52				.9981					
46	DETERMINE DIRECT CURRENT VOLTAGE AND AMPERAGE PARAMETERS	E	II	000.14.53				.9733					

EARTH PARKING ORBIT (CONTINUED)

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	No.	Source	Rel	Source	Rel	A.I.R. Rel	Rel	
47	PERFORM DISPLAY CHECK OF SM-RCS [47 THROUGH 64—EXCEPT 53, 57, 61]	N	III	000.15.02	1.5.1	SELECT S/M SUB SYST. FOR DISPLAY						.9955		
48	ACTIVATE SM-RCS PROPELLANT GAUGING UNIT DETERMINE SM RC SUBSYSTEM A TEMPERA- TURE AND PRESSURE PARAMETERS	N	II	000.15.02	1.5.3	PRESSURIZE OXIDIZER AND FUEL TANKS (SYSTS A, B, C, AND D)						.9848		
49	DETERMINE SM RC SUBSYSTEM A PROPELLANT QUANTITIES	N	II	000.15.09	1.5.3							.9981		
50	ACTIVATE SM RC SUBSYSTEM B DISPLAYS	N	II	000.15.14	1.5.3							.9955		
51	DETERMINE SM RC SUBSYSTEM B TEMPERA- TURE AND PRESSURE PARAMETERS	N	II	000.15.15	1.5.3							.9848		
52	DETERMINE SM RC SUBSYSTEM B PROPELLANT QUANTITIES	N	II	000.15.21	1.5.3							.9981		
53	DETERMINE ALTERNATING CURRENT VOLTAGE PARAMETERS	E	II	000.15.21								.9866		
54	ACTIVATE SM RC SUBSYSTEM C DISPLAYS	N	III	000.15.26	1.5.3							.9955		
55	DETERMINE SM RC SUBSYSTEM C TEMPERA- TURE AND PRESSURE PARAMETERS	N	II	000.15.27	1.5.3							.9848		
56	DETERMINE SM RC SUBSYSTEM C PROPELLANT QUANTITIES	N	II	000.15.34	1.5.3							.9981		
57	ADJUST ECS CONTROLS TO ROUTE COOLANT THROUGH RADIATORS	E	III	000.15.35	2.4	OPEN SPACE RADIATOR VALVES						.9876		
58	ACTIVATE SM RC SUBSYSTEM D DISPLAYS	N	III	000.15.38	1.5.3							.9955		
59	DETERMINE SM RC SUBSYSTEM D TEMPERA- TURE AND PRESSURE PARAMETERS	N	II	000.15.39	1.5.3							.9848		
60	DETERMINE SM RC SUBSYSTEM D PROPELLANT QUANTITIES	N	II	000.15.46	1.5.3							.9981		
61	DETERMINE COOLANT FLOW THROUGH RADIATORS	E	III	000.15.48										
62	DEACTIVATE SM-RCS PROPELLANT GAUGING UNIT	N	III	000.15.51								.9967		
63	ACTIVATE SM RC SUBSYSTEM A DISPLAYS	N	III	000.15.51								.9971		
64	DETERMINE POSITION OF SM-RCS HELIUM ISOLATION AND PROPELLANT SHUTOFF VALVES	N	III	000.15.53								.9784		

EARTH PARKING ORBIT (CONTINUED)

No.	Task	AMPTF DFM II TASKS			MARTIN STUDY TASKS			OTHER DATA		
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel
	VERIFY OPERATION STATUS OF CM-FCS <u>(65 THROUGH 72—EXCEPT 66, 67, 69, 71)</u>									
65	DETERMINE AND LOG CM-RC SUBSYSTEM A TEMPERATURE AND PRESSURE PARAMETERS PRIOR TO SYSTEM PRESSURIZATION	N	II	000.15.59				.9949		
66	SELECT CMC CONTROL OF LV GUIDANCE	C	II	000.16.01				.9969		
67	DETERMINE REQUIRED ATTITUDE	C	III	000.16.03						
68	DETERMINE AND LOG CM-RC SUBSYSTEM B TEMPERATURE AND PRESSURE PARAMETERS PRIOR TO SYSTEM PRESSURIZATION	N	II	000.16.26				.9949		
69	PROGRAM CMC FOR ATTITUDE MANEUVER	C	II	000.16.33				.9464		
70	DETERMINE OPERATIONAL STATUS OF CM RCS HELIUM ISOLATION VALVES	N	II	000.16.50				.9964		
71	ACTIVATE LOW RATE PCM	E	III	000.17.00				.9967		
72	DETERMINE OPERATIONAL STATUS OF CM RCS PROPELLANT SHUTOFF VALVES	N	II	000.17.02				.9964		
	INGRESS TO LEB FROM COUCH 2 <u>(73 THROUGH 76)</u>									
73	DISCONNECT COUCH RESTRAINTS	N	II	000.17.15						
74	LOWER COUCH 2 SEAT PAN TO 172 DEG FROM 96 DEG	N	III	000.17.18	1.1	REMOVE NAVIGATOR SEAT				
75	INGRESS TO LOWER EQUIPMENT BAY	N	III	000.17.21						
76	LOWER COUCH 2 SEAT PAN TO 276 DEG	N	III	000.17.24	1.1	REMOVE NAVIGATOR SEAT				
	IMU ALIGNMENT (77 THROUGH 109)									
77	ACTIVATE LEB ILLUMINATION	N	III	000.17.27				.9990		
78	CHECK STATUS OF MASTER ALARM LIGHT	N	III	000.17.33				.9988		
79	MONITOR ATTITUDE MANEUVER	C	II	000.17.33				.9526		
80	CHECK STATUS OF CONDITION ANNUNCIATORS	N	II	000.17.35						
81	OBTAIN TOOL KIT FROM STORAGE	N	III	000.17.37						
82	REMOVE SHELF AND OPTICS COVER FROM OPTICS MOUNTING PANEL	N	III	000.18.07						
83	INSTALL SHELF AND OPTICS COVER AS WORK SHELF	N	III	000.18.33						
84	OBTAIN SEXTANT AND TELESCOPE EYEPIECES FROM STORAGE	N	III	000.18.53						

EARTH PARKING ORBIT (CONTINUED)

No.	Task	Crew Member	Cri- ciality	Mission Time	No.	Task	Rel	OTHER DATA			Page Ref
								A.I.R. Rel	Source	Rel	
85	REMOVE SCT EYEPIECE FROM STORAGE PANEL	N	III	000.19.03							
86	INSTALL SCT EYEPIECE ON OPTICS MOUNTING BASE	N	III	000.19.13							
87	REMOVE SXT EYEPIECE FROM STORAGE PANEL	N	III	000.19.23							
88	INSTALL SXT EYEPIECE ON SXT MOUNTING BASE	N	III	000.19.33							
89	INSTALL STORAGE PANEL	N	III	000.19.43							
90	OPEN ASTRO-SEXTANT DOORS	N	III	000.19.53							
91	SET G/N POWER OPTICS SWITCH TO ON	N	II	000.20.03	1.2	APPLY OPTICS POWER		.9985			
92	REMOVE ROTATIONAL CONTROLLER NR2 FROM RIGHT HAND COUCH	N	III	000.20.04							
93	INSTALL ROTATIONAL CONTROLLER NR 2 AT LEB	N	III	000.20.24	1.6	ENABLE TRANSLATION CONTROL					
94	REMOVE DATA MANAGEMENT PACKAGE FROM STORAGE	N	III	000.20.44							
95	REMOVE REQUIRED ITEMS FROM DATA MANAGEMENT PACKAGE	N	III	000.20.59							
96	CONNECT BATTERY A TO BATTERY CHARGER	E	II	000.25.00				.9957			
97	SELECT IU CONTROL OF SIVB	C	II	000.26.03							
98	PASS REQUIRED ITEMS FROM DATA MANAGEMENT PACKAGE TO COUCH 1	N	III	000.26.05				.9969			
99	RECEIVE DATA MANAGEMENT MATERIAL	C	III	000.26.05							
100	PASS REQUIRED ITEMS FROM DATA MANAGEMENT PACKAGE TO COUCH 3	N	III	000.26.10							
101	RECEIVE DATA MANAGEMENT MATERIAL	E	III	000.26.10							
102	REPORT LOGIC CIRCUIT TEST OF CAUTION + WARNING SYSTEM ABOUT TO BEGIN	N	III	000.26.15				.9994			
103	RECEIVE REPORT OF CAUTION AND WARNING SYSTEM TEST	C, E	III	000.26.15				.9999			
104	PROGRAM CGC FOR LOGIC CIRCUIT TEST	N	II	000.26.17	1.3.1	INTERROGATE COMPUTER FOR NAVIGATOR FIX.		.9464			
105	MONITOR LOGIC CIRCUIT TEST	C, N, E	II	000.26.39				.9999			
106	REPORT COMPLETION OF TEST	N	III	000.29.21				.9994			
107	RECEIVE TEST COMPLETION REPORT	C, E	III	000.29.21				.9999			
108	PERFORM FUEL CELL	E	II	000.29.23				.9958			

EARTH PARKING ORBIT (CONTINUED)

No.	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA			
	Task	Crew Member	Criticality	Mission Time	No.	Task	Rel.	A.I.R. Rel.	Source	Rel.	Source	Rel.
109	PERFORM IMU ALIGNMENT <u>INGRESS TO COUCH 2 FROM LEB (110 THROUGH 112)</u>	N	II	000.29.23								
110	RAISE COUCH 2 SEAT PAN TO 172 DEG FROM 276 DEG	N	II	000.41.13								
111	INGRESS TO COUCH 2 FROM LOWER EQUIPMENT BAY	N	III	000.41.16								
112	RAISE COUCH 2 SEAT PAN TO 96 DEG FROM 172 DEG	N	III	000.41.19								
	<u>PREPARE FOR STATE VECTOR UPDATE (113 THROUGH 116)</u>											
113	COMMUNICATE REQUEST FOR STATE VECTOR UPDATE TO MSFN	N	III	000.41.24	3.7	ACCEPT UPDATE TELEMETRY		.9940				
114	RECEIVE CONFIRMATION FROM MSFN THAT UPDATE WILL BEGIN AT X MISSION TIME	N	III	000.41.24				.9989				
115	SELECT COAST-CMC UPDATE MAJOR MODE	N	III	000.41.26								
116	PROGRAM CMC	N	II	000.41.28				.9464				
	<u>MONITOR STATE VECTOR UPDATE (117 THROUGH 121)</u>											
117	CHECK DSKY UPTL ACTIVITY LIGHT ON	N	III	000.41.50				.9954				
118	MONITOR MDC CGC FIRING STATE VECTOR UPDATE	N	II	000.41.52					.9922			
119	ALIGN GDC	C	II	000.42.09					.9978			
120	CHECK DSKY UPTL ACTIVITY LIGHT OFF	N	III	000.42.29					.9954			
121	CHECK DSKY PROGRAM INDICATOR FOR CHANGE TO CMC IDLING MN CODE	N	III	000.42.31					.9981			
122	TERMINATE CMC DISPLAY	C	III	000.42.41					.9959			
123	SELECT CMC CONTROL OF LV GUIDANCE	C	II	000.42.46					.9969			
124	DETERMINE REQUIRED ATTITUDE	C	II	000.42.48								
125	PROGRAM CMC FOR ATTITUDE MANEUVER	C	II	000.43.18								
126	MONITOR ATTITUDE MANEUVER	C	II	000.44.18					.9525			
127	CONNECT BATTERY B TO BATTERY CHARGER	E	III	000.45.00					.9957			
128	ACTIVATE LOW RATE PCM	E	III	000.45.15					.9967			
129	RECORD DATA AT NORMAL SPEED	E	III	000.45.15					.9934			

EARTH PARKING ORBIT (CONTINUED)

No.	Task	Crew Member	Criti-cality	Mission Time	No.	Task	Rel	MARTIN STUDY TASKS			OTHER DATA			Page Ref
								A.I.R. Rel.	Source	Rel	Source	Rel		
	<u>IGRESS TO LEB FROM COUCH 2 (130 THROUGH 133)</u>													
130	DISCONNECT COUCH RESTRAINTS	N	III	000.50.00										
131	LOWER COUCH 2 SEAT PAN TO 172 DEG FROM 96 DEG	N	III	000.50.03										
132	IGRESS TO LOWER EQUIPMENT BAY	N	III	000.50.06										
133	LOWER COUCH 2 SEAT PAN TO 276 DEG <u>PREPARE LEB FOR USE (134 THROUGH 138)</u>	N	III	000.50.09										
134	ACTIVATE LEB ILLUMINATION	N	III	000.50.12										.9980
135	CHECK STATUS OF MASTER ALARM LIGHT	N	II	000.50.18										.9988
136	CHECK STATUS OF CONDITION ANNUNCIATORS	N	II	000.50.20										
137	DEACTIVATE TAPE RECORDER	E	III	000.51.57										.9901
138	MONITOR MISSION ELAPSED TIMER FOR EVENT TIMER START TIME	C	III	000.52.48										.9901
139	COMMUNICATE HIGH RATE PCM DATA <u>PERFORM PRE-THRUST MSFN COMM (140 THROUGH 145 AND 151 THROUGH 153)</u>	E	III	000.52.57										.9961
140	PROGRAM CMC FOR PRE-TLI MAJOR MODE	N	III	000.52.58										.9980
141	ENTER THRUSTING DATA INTO CMC	N	II	000.53.08										.9999
142	MONITOR ENTRY OF THRUSTING DATA INTO CMC	C	II	000.53.08										.9999
143	MONITOR CMC DISPLAY OF FINAL THRUSTING DATA	C,N	II	000.58.08										.9999
144	ACTIVATE LOW RATE PCM	E	III	000.59.06										.9987
145	RECORD DATA AT NORMAL SPEED	E	III	000.59.06										.9934
146	PERFORM ECS STATUS CHECK <u>PERFORM EPS STATUS CHECK (147 THROUGH 150 AND 162 THROUGH 165)</u>	E	III	001.00.00										
147	DETERMINE CRYO TANKS H ₂ AND O ₂ PRESS., QUANTITY	E	II	001.00.24										.9834
148	DETERMINE FUEL CELL REACTANTS VALVES OPEN	E	II	001.00.29										.9946
149	DETERMINE FUEL CELL 1 FLOW AND TEMP. READINGS, PH STATUS, REGULATOR OUTLET PRESSURES, RADIATOR TEMP. STATUS	E	II	001.00.31										.9712

EARTH PARKING ORBIT (CONTINUED)

No.	Task	Crew Member	Criti-cality	Mission Time	No.	Task	Rel	OTHER DATA			Page Ref
								A.I.R. Ref	Source	Rel	
AMPTF DRM II TASKS											
150	DETERMINE FUEL CELL 2 FLOW AND TEMP READINGS, PH STATUS REGULATOR OUTLET PRESSURES, RADIATOR TEMP STATUS	E	II	001.02.01							.9712
151	RECEIVE MSFN CONFIRMATION OF THRUSTING PARAMETERS	C, N	II	001.02.08							.9989
152	MONITOR CMC DISPLAY OF TTE	C, N	II	001.02.13							.9922
153	ACTIVATE LEB TIME TO EVENT TIMER	N	II	001.02.18							.9971
154	SET DIGITAL EVENT TIMER FOR TTE	C	II	001.02.18							.9934
155	SET G/N POWER OPTICS SWITCH TO ON	N	III	001.02.28							.9985
156	ACTIVATE DOCKING PROBE EXTEND CIRCUIT	C	II	001.02.28							.9958
157	MONITOR PROBE EXTEND/RELEASE TALKBACK INDICATES PROPER OPERATION	C	II	001.02.30							.9982
158	DEACTIVATE DOCKING PROBE EXTEND/RELEASE CIRCUIT	C	II	001.02.40							.9958
159	ACTIVATE DOCKING PROBE PRIMARY 1 RETRACTION CIRCUIT	C	II	001.02.42							.9958
160	DEACTIVATE SEQUENCER ARMING CIRCUIT	C	II	001.02.44							.9938
161	DEACTIVATE DOCKING PROBE SECONDARY 1 RETRACTION CIRCUIT	C	II	001.02.46							.9958
162	DETERMINE FUEL CELL 3 FLOW AND TEMP READING, PH STATUS REGULATOR OUTLET PRESSURE, RADIATOR TEMP STATUS	E	II	001.03.31							.9712
163	DETERMINE FUEL CELLS CONNECTED TO DC BUSSES	E	II	001.05.01							.9892
164	DETERMINE DC VOLTAGE AND AMPERAGE PARAMETERS	E	II	001.05.05							.9733
165	DETERMINE AC VOLTAGE PARAMETERS	E	II	001.05.34							.9866
166	CONNECT BATTERY C TO BATTERY CHARGER	E	II	001.05.47							.9957
<u>PERFORM C&W SYSTEM TEST (167 THROUGH 172)</u>											
167	REPORT LOGIC CIRCUIT TEST OF CAUTION + WARNING SYSTEM ABOUT TO BEGIN	N	III	001.05.47							.9994
168	RECEIVE REPORT OF CAUTION AND WARNING SYSTEM TEST	C	III	001.05.47							.9989
169	PROGRAM CGC FOR LOGIC CIRCUIT TEST	N	III	001.05.49							.9464
170	MONITOR LOGIC CIRCUIT TEST	C, N	III	001.05.49							.9999

EARTH PARKING ORBIT (CONTINUED)

No.	Task	AMPTF DRA II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Rel	
171	RECEIVE TEST COMPLETION REPORT	C	III	001.08.31				.9989						
172	REPORT COMPLETION OF TEST	N	III	001.08.53				.9994						
173	<u>IMU ALIGNMENT</u>			001.08.57										
174	DEACTIVATE TAPE RECORDER	E	III	001.08.55				.9961						
175	COMMUNICATE HIGH RATE PCM DATA	E	III	001.09.55				.9961						
176	<u>INGRESS TO COUCH 2 FROM LEB</u>			001.23.50										
177	ACTIVATE BOTH SCS IND POWER	C	II	001.25.55				.9957						
178	SELECT BOTH TVC SERVO POWER	C	II	001.25.57				.9957						
179	SELECT GDC/ECA SCS ELECTRONICS POWER	C	II	001.25.59				.9950						
180	PROGRAM CMC FOR TLI MONITORING MAJOR MODE	C	II	001.26.01				.9464						
181	CHECK CMC FLASHING DISPLAY OF DESIRED FINAL ICDU GIMBAL ANGLES	C	II	001.26.11				.9922						
182	ENTER IMU GIMBAL ANGLES INTO ATTITUDE SET	C	II	001.26.16										
183	DEACTIVATE TAPE RECORDER	E	III	001.26.43				.9967						
184	ALIGN GDC	C	III	001.27.19				.9978						
185	COMMUNICATE HIGH RATE PCM DATA	E	III	001.27.43				.9934						
186	DETERMINE CHARGE STATUS OF BATTERIES A, B, AND C	E	II	001.27.45										
187	ENTER PROCEED COMMAND INTO CMC	C	II	001.27.51				.9464						
188	CHECK CMC FOR DISPLAY OF DELTA VEL + TTE	C	II	001.27.52				.9922						
189	DISCONNECT BATTERY CHARGER	E	III	001.27.55				.9957						
190	PERFORM EMS SELF TEST PRIOR TO A DELTA V. THERE ARE TWO POSITIONS ON THE EMS MODE DIAL WHICH WILL EXERCISE THE DELTA V DIGITAL INDICATOR + THE SPS THRUST LIGHT	C	III	001.27.57				.9890						
191	ENTER DELTA VEL REQUIRED INTO DELTA VELOCITY DISPLAY	C	II	001.27.57										
192	ACTIVATE MASTER EVENT SEQUENCE CONTROLLER	C	II	001.28.08				.9876						
193	ACTIVATE LV TLI CAPABILITY	C	II	001.28.11				.9973						

EARTH PARKING ORBIT (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	Source	Rel	Source	
194	PERFORM EMS SELF TEST FOR ENTRY. THERE ARE FIVE POSITIONS ON THE EMS MODE SELECTOR DIAL WHICH WHEN SELECTED WILL SEQUENTIALLY EXERCISE THE POINT 05 G LIGHT, THE EMS SCROLL, THE EMS SCRIBE, THE EMS UPPER + LOWER ROLL LIGHTS + THE RANGE DIGITAL INDICATOR.	C	III	001.28.13							.9726
195	PREPARE EMS PRIOR TO TRANS-LUNAR INJECTION, THE EMS IS PREPARED FOR AN EMERGENCY ABORT	C	II	001.28.13							.9934
196	PERFORM UPDATING OF DIGITAL EVENT TIMER	C	II	001.28.13							.9880
197	SELECT RATE MODE FOR BMAG 1	C	III	001.28.35							.9525
198	MONITOR FDAI <u>POWER-UP EPS PEAK POWER MODE 499 THROUGH 209</u>	C	III	001.28.13							
199	REQUEST PREPARATION OF EPS FOR PEAK POWER LOADS	C	II	001.28.13							.9994
200	RECEIVE REQUEST FOR EPS PREPARATION FOR PEAK POWER LOADS	E	II	001.28.13							.9989
201	DETERMINE DIRECT CURRENT VOLTAGE AND AMPERAGE PARAMETERS	E	II	001.28.16							.9733
202	DETERMINE ALTERNATING CURRENT VOLTAGE PARAMETERS	E	II	001.28.44							.9866
203	CONNECT BATTERIES A+C TO MAIN DC BUSSES	E	II	001.28.58							.9969
204	ACTIVATE AC INVERTER 2	E	II	001.29.00							.9969
205	DETERMINE ALTERNATING CURRENT VOLTAGE PARAMETERS	E	II	001.29.09							.9866
206	PLACE INVERTER 3 IN STANDBY MODE	E	II	001.29.23							.9960
207	DETERMINE DIRECT CURRENT VOLTAGE AND AMPERAGE PARAMETERS	E	II	001.29.25							.9733
208	REPORT COMPLETION OF PREPARATION OF EPS FOR PEAK POWER	E	II	001.29.53							.9994
209	RECEIVE REPORT OF COMPLETION OF EPS PREPARATIONS FOR PEAK POWER LOADS	C	II	001.29.53							.9989
210	ACTIVATE LOW RATE PCM	E	III	001.31.19							.9967
211	ACTIVATE TAPE TRANSPORT TO REWIND TAPE	E	III	001.31.19							.9961
212	ACTIVATE PITCH 2 AND YAW 2 GIMBAL MOTOR	C	II	001.31.21							.9934

EARTH PARKING ORBIT (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	Source	Rel	Source	
213	COMMUNICATE IN S-BAND TAPE MODE	E	III	001.31.21				.9961			
214	PLAYBACK AT HIGH SPEED RECORDED LOW BIT RATE PCM DATA	E	III	001.31.24				.9961			
215	ACTIVATE PITCH 1 AND YAW 1 GIMBAL MOTOR	C	II	001.31.25				.9934			
216	ACTIVATE TAPE TRANSPORT TO REWIND TAPE	E	III	001.33.29				.9961			
217	COMMUNICATE HIGH RATE PCM DATA	E	III	001.33.30				.9961			
218	RECORD DATA AT NORMAL SPEED	E	III	001.33.31				.9961			
219	<u>CHECK SPS CONTROLS AND DISPLAY</u>	E	III	001.33.31							
	<u>PERFORM FINAL COUNTDOWN (220 THROUGH 223)</u>										
220	COMMUNICATE BEGINNING OF FINAL TWO MINUTES	C		001.34.08				.9994			
221	RECEIVE REPORT OF FINAL TWO MINUTES	N, E	II	001.34.08				.9989			
222	CHECK CMC FOR DELTA VELOCITY AND TIME TO EVENT	C, N	II	001.34.11				.9922			
223	MONITOR FDAO	C, N	II	001.34.20				.9525			
224	MONITOR S-IVB ULLAGE	C	II	001.35.08							

TRANS-LUNAR INJECTION

No.	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
	Task	Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	
1	MONITOR SYSTEM TLI THRUSTING	E	II	001.35.08				.9483					
2	CHECK CMC FOR DELTA VELOCITY AND TIME FROM EVENT	C,N	II	001.35.08	1.1	PROGRAM COMP FOR ΔV AND TIME		.9999					
3	MONITOR FDAI	C,N	II	001.35.14				.9999					
4	MONITOR SIVB ENGINE STATUS	C	II	001.35.14	2.3	CONTROL S/C ATTITUDE TO CUTOFF							
5	MONITOR DELTA VELOCITY REMAINING	C	II	001.35.24	1.3	SET ΔV		.9957					

TRANS-LUNAR COAST-S-IVB JETTISON

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA			
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Page Ref
1	MONITOR S-IVB CUTOFF	E	II	001.40.50	2.3	CONTROL S/C ATTITUDE TO CUTOFF		.9936					
2	VERIFY S-IVB CUTOFF	C	II	001.40.50	2.3			.9999					
3	CHECK CMC DISPLAY TERMINATES	N	III	001.40.50				.9965					
4	DEACTIVATE LV TLI CAPABILITY	C	II	001.40.53	2.7	DEACTIVATE ROT HAND CONTROL		.9973					
5	CHECK CMC DISPLAY TERMINATES	C	III	001.40.55				.9965					
6	COMMUNICATE CONFIRMATION OF THRUST OFF	C	III	001.40.57				.9994					
7	RECEIVE REPORT OF THRUST OFF	N, E	III	001.40.57				.9999					
8	DEACTIVATE TAPE RECORDER	E	III	001.41.00	1.2, 1	CHECK TRANS. SWITCH DIRECTION		.9812					
<u>DETERMINE RESULTS OF SPS THRUSTING (9-12)</u>													
9	PROGRAM CMC FOR DISPLAY OF MIDCOURSE PARAMETERS	C	III	001.41.00				.9464					
10	MONITOR CMC DISPLAY OF TRAJECTORY PARAMETERS	C, N	III	001.41.10				.9999					
11	ENTER PROCEED COMMAND INTO CMC	C	III	001.41.40				.9464					
12	CHECK CMC IN IDLING MODE (STANDBY)	C, N	III	001.41.42				.9999					
13	SELECT CMC CONTROL OF LV GUIDANCE	C	III	001.41.44	2.5	SELECT CONTROL MODE		.9989					
14	DETERMINE REQUIRED ATTITUDE	C	III	001.41.46	2.4	ORIENT S/C		.9983					
15	<u>ECS STATUS CHECK</u>	E		001.42.00									
16	PROGRAM CMC FOR ATTITUDE MANEUVER	C	III	001.42.16	1.9	PROGRAM COMP FOR ATTITUDE		.9464					
17	<u>EPS STATUS CHECK</u>			001.42.24		REFER TO PO-2							
18	MONITOR ATTITUDE MANEUVER	C	III	001.43.16				.9525					
19	SELECT IU CONTROL OF S-IVB	C	III	001.51.46				.9973					
20	SELECT ATTITUDE MODE FOR BMAG1	C	III	001.51.48	1.7	SELECT CONTROL MODE		.9942					
21	CALL UP PRESENT ICDU/GIMBAL ANGLES	C	II	001.51.49	2.11	CHECK SFS GIMBAL ANGLE		.9901					
22	CHECK CMC FLASHING DISPLAY OF DESIRED FINAL ICDU GIMBAL ANGLES	C	II	001.51.59	2.11	CHECK SFS GIMBAL ANGLE		.9983					
23	ENTER IMU GIMBAL ANGLES INTO ATTITUDE SET	C	II	001.52.04				.9840					
24	ALIGN GDC	C	III	001.53.06				.9878					

TRANS-LUNAR COAST-S-IVB JETTRISON (CONTINUED)

No.	Task	AMP/TF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	
25	TERMINATE CMC DISPLAY	C	III	001.53.38				.9959			
26	DEACTIVATE ALL SPS GIMBAL MOTORS	C	II	001.53.43				.9947			
27	DEACTIVATE POWER TO BOTH TVC SUB-SYSTEMS	C	III	001.53.47				.9920			
28	DEACTIVATE INJECT PRE-VALVE	C	III	001.53.49				.9960			
29	SELECT EMS/DELTA VEL STANDBY MODE	C	III	001.53.51	1.7	SELECT CONTROL MODE		.9960			
30	SELECT CMC HOLD MODE	C	III	001.53.53	2.13.1	BLOCK UPLINK TELEMETRY		.9960			
31	PREPARE EMS FOR TRANSPOSITION DELTA VELOCITY OF 0.8 FT/SEC	C	II	001.53.55				.9907			
32	SELECT MINIMUM DEADBAND MODE	C	III	001.54.25	1.3	SELECT ATTITUDE (DEADBAND) LIMIT		.9969			
33	UNLOCK TRANSLATION CONTROLLER	C	II	001.54.26							
34	PREPARE COAS	C	III	001.54.28							
35	SET DET FOR TFE	C	III	001.54.58				.9928			
36	RECEIVE MSFN CONFIRMATION OF DELTA VELOCITY SUCCESS. THIS INDICATES NORMAL PROCEDURES CAN CONTINUE	N	III	001.55.00				.9989			
37	PREPARE FOR STATE VECTOR UPDATE	N		001.55.03							
38	MONITOR STATE VECTOR UPDATE	N		001.55.31							
39	RELEASE COUCH FEET RESTRAINTS	C, N, E	II	001.56.21							
40	RAISE FEET AND EXTEND LEGS	C, N, E	II	001.56.27							
41	REPLACE SHOULDER HARNESS	C, N, E	III	001.56.27							
42	MOVE COUCHES TO DOCKING POSITION	C, N, E	II	001.56.52	1.1	REMOVE NAVIGATOR SEAT					
43	INITIATE +X AND ACTIVATE DET	C	II	001.57.04							
44	INITIATE CSM SEPARATION AND DEPLOYMENT OF SLA PANELS	C	II	001.57.05							
45	MONITOR CSM RATE STABILIZATION	C	II	001.57.07				.9525			
46	TERMINATE +X COMMAND AT T +8 SEC	C	II	001.57.12							
47	COAST UNTIL T +1 MIN +21 SEC	C	II	001.57.13				.9965			
48	SECURE EDS FOR ELECTRICAL POWER CONSERVATION	C	III	001.58.25				.9969			
49	INITIATE -X TRANSLATION FOR 4 SECONDS	C	II	001.58.30				.9841			

TRANS-LUNAR COAST-S-IVB JETTISON (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	Source	Ref	Source	
50	MONITOR CSM RATE STABILIZATION	C	II	001.58.34							.9525
51	DEACTIVATE EVENT TIMER	C	III	001.58.39							.9964
52	DEACTIVATE PITCH CHANNEL	C	II	001.58.40							.9969
53	ESTABLISH 5 DEG PITCH RATE	C	II	001.58.42							.9390
54	MAINTAIN PITCH RATE UNTIL 168 DEGREES OF ROTATION	C	II	001.58.46							.9525
55	NULL PITCH RATE	C	III	001.59.17							.9390
56	VERIFY POSITION TO LEM AND SLA DEPLOYMENT	C	II	001.59.47							
57	ACTIVATE PITCH CHANNEL	C	II	001.59.57							.9969
58	DEACTIVATE ROLL CHANNEL	C	II	001.59.58							.9957
59	ROLL CSM 60 DEG	C	III	002.00.00							.9390
60	ACTIVATE ROLL CHANNEL	C	II	002.01.27							.9959
61	SELECT HIGH GAIN ANTENNA FOR S-BAND COMMUNICATIONS	E	III	002.01.29	2.8	SELECT S-BAND AT 2000 MILES					.9969
62	ALIGN HIGH-GAIN ANTENNA WITH EARTH	E	III	002.01.32	2.8.5	DEPLOY HIGH-GAIN ANTENNA					.9959
63	PREPARE S-BAND TO TRANSMIT VOICE, PCM AND RANGING VIA HIGH GAIN ANTENNA	E	III	002.04.34	2.8.7	COMMUNICATE OVER S-BAND					.9819
64	DEACTIVATE VHF/AM TRANSCEIVER	E	III	002.04.39							.9880
65	PERFORM REQUIRED ATTITUDE ALIGNMENT USING COAS + LEM TARGET	C	II	002.04.39	2.3	CONTROL S/C ATTITUDE					
66	ECS STATUS CHECK			002.04.41		REFER TO PO-1					
67	EPS STATUS CHECK			002.05.05		REFER TO PO-2					
68	VERIFY INITIAL DOCKING	C	II	002.07.10							
69	MONITOR PROBE EXTEND/RELEASE TALKBACK INDICATES PROPER OPERATION	C,N	III	002.07.20							
70	INGRESS TO LEB FROM COUCH 2	N									
71	SELECT EMS/DELTA VEL STANDBY MODE	C	II	002.07.30							.9960
72	SELECT SCS INDICATOR 1 POWER	C	II	002.07.32							.9948
73	SELECT FDAL 1	C	II	002.07.34							.9962
74	LOCK TRANSLATIONAL CONTROLLER	C	II	002.07.36							.9944
75	SELECT RATE MODE FOR BMAG 1	C	II	002.07.38							

TRANS-LUNAR COAST-S-IVB JETTISON (CONTINUED)

No.	Task	Crew Member	Criti- cality	Mission Time	No.	Task	Rel	OTHER DATA			Page Ref
								A.I.R. Rel.	Source	Rel	
76	PERFORM DISPLAY CHECK OF SM-RCS	C	II	002.07.39		REFER TO PO-7					
77	REMOVE WRENCH FROM TOOL KIT	N	III	002.07.42							
78	ADJUST PRESSURIZATION VALVE TO PRES- SURIZE TUNNEL AND LEM	N	III	002.08.18							
79	REMOVE THERMAL BAGS FROM STORAGE	N	III	002.08.33							
80	VERIFY OPERATIONAL STATUS OF CM-RCS	C	II	002.08.36		REFER TO PO-6					
81	PASS THERMAL BAGS TO SYSTEMS ENGINEER TO HOLD	N	III	002.09.03							
82	OBTAIN FROM STOWAGE AND DON THE UPPER THERMAL METEOROID GARMENT	N	III	002.09.13							
83	CHECK SPS CONTROLS AND DISPLAYS	E	II	002.10.28		REFER TO PO-8					
84	OBTAIN AND DON TMG GLOVES	N	III	002.12.13							
85	OBTAIN TOOL KIT FROM STORAGE	N	III	002.12.43							
86	REMOVE COUCH 2 BACK PAD AND STOW IN PGA SUIT BAG	N	III	002.13.13							
87	ACTIVATE TUNNEL LIGHTS CIRCUIT	C	III	002.13.43							
88	RELEASE PRESSURE HATCH AND REMOVE FROM FITTINGS	N	III	002.13.43							
89	STOW CM PRESSURE HATCH IN COMMAND MODULE	N	III	002.13.48							
90	RELEASE THERMAL HATCH AND REMOVE FROM FITTINGS	N	III	002.14.18							
91	PLACE THERMAL HATCH IN THERMAL BAG AND STOW	N	III	002.16.18							
92	CLOSE AND SECURE ALL FINAL DOCKING LATCHES	N	III	002.19.18							
93	RELEASE REMAINING GAS PRESSURE IN PROBE RETRACTION CHAMBER	N	III	002.22.18							
94	DISCONNECT PROBE ELECTRICAL UMBILICALS	N	III	002.22.28							
95	STOW PROBE ELECTRICAL UMBILICALS	N	III	002.22.58							
96	UNLOCK PROBE TENSION LINKS	N	III	002.23.28		2.4.1 UNLOCK STACK (V)					
97	ADJUST PRESSURIZATION VALVE TO PRES- SURIZE TUNNEL AND LEM	N	III	002.24.28							
98	RELEASE PROBE SLIDING COLLAR	N	III	002.24.43							

TRANS-LUNAR COAST-S-IVB JETTISON (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Crit. colity	Mission Time	No.	Task	Time	A.I.R. Rel	Source	Rel	
99	RELEASE PROBE FROM DROGUE	N	III	002.24.43							
100	REMOVE PROBE FROM TUNNEL	N	III	002.25.13							
101	PLACE PROBE IN THERMAL STOWAGE BAG	N	III	002.25.43							
102	PASS PROBE TO SYSTEMS ENGINEER FOR STOWING	N	III	002.26.43							
103	RECEIVE PROBE FROM NAVIGATOR	E	III	002.26.53							
104	STOW PROBE IN COMMAND MODULE	E	III	002.26.53							
105	CONNECT ELECTRICAL UMBILICALS BETWEEN CSM AND LEM	N	III	002.26.53							
106	REMOVE CM THERMAL HATCH FROM STOWAGE	N	III	002.27.53							
107	REMOVE CM THERMAL HATCH FROM THERMAL STORAGE BAG	N	III	002.28.08							
108	INSTALL CM THERMAL HATCH IN TUNNEL	N	III	002.28.23							
109	REMOVE CM PRESSURE HATCH FROM STOWAGE IN COMMAND MODULE	N	III	002.29.23							
110	INSTALL CM PRESSURE HATCH IN TUNNEL	N	III	002.29.38							
111	SET LEM PRESSURIZATION VALVE TO READ LEM AND TUNNEL PRESSURE DECAY DURING TRANSLUNAR COAST	N	III	002.30.38							
112	RETURN TOOL KIT TO STORAGE	N	III	002.30.53							
113	DOFF AND STOW TMG GLOVES	N	III	002.31.24							
114	DOFF AND STOW TMG UPPER GARMENT	N	III	002.31.54							
115	INGRESS TO COUCH 2 FROM LEB	N	III	002.32.54							
116	MOVE COUCHES TO NORMAL OPERATING POSITION	C,N,E	III	002.33.03							

S-IVB JETTISON AND MID-COURSE CORRECTION

No.	Task	AMP/T DRMI TASKS				MARTH STUDY TASKS				OTHER DATA			
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Page Ref
1	COMMUNICATE BEGINNING OF FINAL TWO MINUTES OF COUNTDOWN	C	II	004.41.56				.9994					
2	RECEIVE REPORT OF FINAL TWO MINUTES	N	II	004.41.56				.9989					
3	CHECK CMC FOR DELTA VELOCITY AND TIME TO EVENT	N	III	004.41.59				.9942					
4	UNLOCK TRANSLATION CONTROLLER	C	II	004.41.59									
5	ACTIVATE INJECT PRE-VALVE A	C	II	004.42.01									
6	SELECT NORMAL THRUST MODE	C	II	004.42.02									
7	MONITOR FDAO	C	III	004.42.04	1.160	FDAO ALIGN							
8	MONITOR TIME TO EVENT	C	III	004.42.04									
9	CHECK CMC FOR DELTA VELOCITY AND TIME TO EVENT	C	III	004.42.04									
10	MONITOR FDAO	N	III	004.42.08	1.160	FDAO ALIGN							
11	RECORD DATA AT NORMAL SPEED	E	II	004.42.56									
12	ACTIVATE SPS GAUGING SYSTEM	E	II	004.42.59									
13	MONITOR THRUSTING	N	III	004.43.56									
14	VERIFY SPS IGNITION	C,N	III	004.43.56									
15	MONITOR FDAO	C	III	004.43.56	1.160	FDAO ALIGN							
16	MONITOR GPI	C	III	004.43.56									
17	CHECK CMC FOR DELTA VELOCITY AND TIME FROM EVENT	N	III	004.43.56									
18	DETERMINE SPS CHAMBER PRESSURE NORMAL DURING ENGINE FIRING	C	III	004.43.57									
19	CHECK CMC FOR DELTA VELOCITY AND TIME FROM EVENT	C	III	004.43.59									
20	MONITOR DELTA VELOCITY REMAINING	C	III	004.44.06									
21	PREPARE FOR SPS CUTOFF	C	II	004.44.06									
22	MONITOR SPS SHUTDOWN	C,N	III	004.44.11									
23	CHECK CMC DISPLAY TERMINATES	N	III	004.44.11									
24	CHECK SPS ENGINE INJECTOR EVENT INDICATOR	E	III	004.44.11									
25	SELECT THRUST OFF MODE	C	II	004.44.11									

S-IVB JETTISON AND MID-COURSE CORRECTION (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA				
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel
26	LOCK TRANSLATIONAL CONTROLLER	C	II	004.44.12				.9956				
27	DEACTIVATE SPS GAUGING SYSTEM	E	II	004.44.13								
28	COMMUNICATE CONFIRMATION OF THRUST OFF	C	III	004.44.14				.9994				
29	RECEIVE REPORT OF THRUST OFF	N	III	004.44.14				.9989				

LUNAR ORBIT INSERTION

No.	Task	AMP/T DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Crit.- cality	Mission Time	No.	Task	Rel	Source	Rel	Source	
1	VERIFY SPS IGNITION	C, N	II	063.16.39	2.2	FIRE SPS ENGINE		.9999			
2	CHECK SPS ENGINE INJECTOR VALVE EVENT INDICATORS DURING ENGINE FIRING	E	II	063.16.39	2.3	CHECK INJECTOR VALVES		.9537			
3	MONITOR FDAO	C, N	II	063.16.39	2.6	CHECK S/C ATTITUDE		.9998			
4	MONITOR GPI	C	II	063.16.39	1.5	SET SPS GIMBAL ANGLES		.9666			
5	CHECK CMC FOR DELTA VELOCITY AND TIME FROM EVENT	N	II	063.16.39	1.1	INTERROGATE COMPUTER (AV AND TIME)		.9942			
6	DETERMINE SPS CHAMBER PRESSURE NORMAL DURING ENGINE FIRING	C	II	063.16.39				.9941			
7	CHECK SPS OXIDIZER AND FUEL QUANTITY DIGITAL INDICATORS AND UNBALANCE METER	E	II	063.16.41	2.4	CHECK FUEL AND OXIDIZER PRESSURES		.9839			
					2.5	CHECK OXIDIZER—FUEL UNBALANCE					
8	CHECK CMC FOR DELTA VELOCITY AND TIME FROM EVENT	C	II	063.16.42	1.1	INTERROGATE COMPUTER (AV AND TIME)		.9942			
9	CHECK SPS HELIUM PRESSURE CONTROL SUB-SYSTEM DURING ENGINE FIRING	E	II	063.16.43				.9904			
10	CHECK SPS PRESSURE AND TEMPERATURE PARAMETERS DURING ENGINE FIRING	E	II	063.16.44				.9882			
11	MANAGE SPS PROPELLANT UTILIZATION UNIT	E	II	063.16.49				.9925			
12	MONITOR DELTA VELOCITY REMAINING	C	II	063.16.49				.9957			
13	PREPARE FOR SPS CUTOFF	C	II	063.16.49	2.7	PERFORM THRUST OFF		.9974			

LUNAR ORBIT COAST/LEM SEPARATION

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criti- cality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	
1	MONITOR SPS SHUTDOWN	CNE	II	063.23.27				.9999			
2	DEACTIVATE SPS GAUGING SYSTEM	E	II	063.23.29				.9817			
3	DEACTIVATE TAPE RECORDER	E	III	063.23.31				.9967			
4	DETERMINE RESULTS OF SPS THRUSTING	CN	II	063.23.33							
5	ACTIVATE LOW RATE PCM	E	III	063.24.31				.9967			
6	POWER DOWN EPS FROM PEAK POWER MODE	E	II	063.24.32							
7	SECURE SYSTEMS AFTER LOI THRUSTING	C	II	063.24.47							
8	DEACTIVATE ALL SPS GIMBAL MOTORS	C	II	063.24.47				.9868			
9	DEACTIVATE EVENT TIMER	C	II	063.24.51				.9969			
10	DEACTIVATE POWER TO BOTH TVC SUB-SYSTEMS	C	II	063.24.53				.9920			
11	SELECT SCS INDICATOR 1 POWER	C	II	063.24.55				.9957			
12	SELECT ECA SCS ELECTRONICS POWER	C	II	063.24.57				.9950			
13	DEACTIVATE BMAG 1 POWER	C	II	063.24.59				.9957			
14	SELECT EMS/DELTA VEL STANDBY MODE	C	II	063.25.01				.9960			
15	DEACTIVATE EMS	C	II	063.25.03				.9945			
16	SELECT FDAL 1	C	II	063.25.05				.9960			
17	DEACTIVATE MANUAL DIRECT ATTITUDE CONTROL MODE CAPABILITY	C	II	063.25.07				.9967			
18	DEACTIVATE INJECT PRE-VALVE	C	II	063.25.09				.9973			
19	SELECT ATTITUDE MODE FOR BMAG 1	C	II	063.25.10				.9880			
20	CONNECT BATTERY A TO BATTERY CHARGER	E	II	063.26.11				.9957			
21	CHECK SPS PARAMETERS AND PROPELLANT STATUS	E	II	063.26.13				.9882			
22	PREPARE COUCHES TO USE DOCKING WINDOWS	CNE	III	063.28.51							
23	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 2	N	III	063.28.57							
24	PREPARE LOWER EQUIPMENT BAY FOR USE	N	III	063.29.09							
25	OBTAIN AND DON CREWMAN INFILIGHT TOOL SET, LOWER EQUIPMENT BAY	N	III	063.29.19							
26	MOVE COUCHES TO DOCKING POSITION	CE	III	063.29.22							

LUNAR ORBIT COAST/LEM SEPARATION (CONTINUED)

No.	Task	Crew Member	Criti- cality	Mission Time	No.	Task	Rel	MARTIN STUDY TASKS			OTHER DATA			Page Ref
								A.I.R. Rel	Source	Rel	Source	Rel		
27	PERFORM OPENING OF ASTROSEXTANT DOORS, LEB	N	II	063.29.49										
28	RETURN CREWMAN INFLIGHT TOOL SET TO STORAGE LOWER EQUIPMENT BAY	N	III	063.29.59										
29	REMOVE ROTATIONAL CONTROLLER NR 2 FROM RIGHT HAND COUCH	N	II	063.30.30										
30	INSTALL ROTATIONAL CONTROLLER NR 2 AT LEB	N	II	063.30.50										
31	PERFORM CAUTION AND WARNING SYSTEM TEST, LOWER EQUIPMENT BAY	N	III	063.31.10										
32	MONITOR CAUTION AND WARNING SYSTEM TEST	CE	III	063.31.10										
33	MONITOR CGC PROGRAM FOR IMU ALIGNMENT	C	II	063.34.18										
34	PREPARE FOR IMU COARSE ALIGNMENT, LEB	N	II	063.34.18										
	PERFORM IMU ALIGNMENT			063.35.42		REFER TO PO-9								
35	OPERATE S-BAND AT HIGH POWER	E	III	063.50.27										
36	PLAYBACK RECORDED DATA AT HIGH SPEED TO MSFN	E	III	063.50.35										
37	ACTIVATE TAPE TRANSPORT TO REWIND TAPE	E	III	063.52.40										
38	ACTIVATE HI RATE PCM DATA	E	III	063.52.41										
39	ACTIVATE S-BAND POWER AMPLIFIER TO LOW POWER MODE	E	III	063.52.42										
40	PERFORM EPS CHECK	E	II	063.52.44		REFER TO PO-1								
41	PERFORM EPS CHECK	E	II	063.53.08		REFER TO PO-2								
42	ORIENT FOR LUNAR LANDMARK NAV SIGHTINGS	C	II	063.54.10										
43	COMMUNICATE BEGINNING OF LANDMARK NAV PROCEDURE	N	II	063.54.10										
44	OBTAIN LANDMARK NAV PROCEDURE	N	II	063.54.12										
45	PROGRAM CMC FOR LANDMARK NAV PROCEDURE	N	II	063.54.17										
46	PREPARE OPTICS FOR LANDMARK SIGHTING, LEB	N	II	063.54.43										
47	PERFORM DISPLAYS CHECK OF SM RCS	N	III	063.55.36		REFER TO PO-7								
48	DEACTIVATE TAPE RECORDER	E	III	063.58.32										

LUNAR ORBIT COAST/LEM SEPARATION (CONTINUED)

No.	Task	Crew Member	Criti-cality	Mission Time	MARTIN STUDY TASKS			OTHER DATA		
					No.	Task	Rel	A.I.R. Rel	Source	Rel
49	CHECK SPS CONTROLS AND DISPLAYS	E	III	063.59.32		REFER TO PO-8				
50	PERFORM LANDMARK SIGHTING ROUTINE, LEB	N	II	064.04.38		REFER TO PO-10.3				
51	MONITOR LANDMARK SIGHTING	C	II	064.04.38		REFER TO PO-10.3				
52	PERFORM LANDMARK SIGHTING ROUTINE, LEB	N	II	064.09.38		REFER TO PO-10.3				
53	MONITOR LANDMARK SIGHTING	C	II	064.09.38		REFER TO PO-10.3				
54	PERFORM LANDMARK SIGHTING ROUTINE, LEB	N	II	064.14.38		REFER TO PO-10.3				
55	MONITOR LANDMARK SIGHTING	C	II	064.14.38		REFER TO PO-10.3				
56	PERFORM LEM LUNAR LANDING SITE SIGHTING	N	II	064.24.38		REFER TO PO-10.3				
57	MONITOR LANDMARK SIGHTING	C	II	064.24.38		REFER TO PO-10.3				
58	PERFORM LANDMARK SIGHTING ROUTINE, LEB	N	II	064.29.38		REFER TO PO-10.3				
59	MONITOR LANDMARK SIGHTING	C	II	064.29.38		REFER TO PO-10.3				
60	MONITOR CMC CAL C OF ORBIT PARA CHANGES	CN	II	064.33.41			.9922			
61	TERMINATE CSM LOCAL ATTITUDE HOLD MODE	C	II	064.34.11			.9959			
62	PREPARE ROTATIONAL CONTROLLER FOR USE, LEB	N	II	064.34.11						
63	ORIENT TO INSURE COMMUNICATIONS	C	II	064.34.13						
64	SECURE LEB	N	III	064.34.41						
65	OBTAIN AND DON CREWMAN IN-FLIGHT TOOL SET, LOWER EQUIPMENT BAY	N	II	064.35.03						
66	RETURN TOOL KIT TO STORAGE	N	III	064.36.04						
67	INGRESS TO COUCH 2 FROM LOWER EQUIPMENT BAY	N	III	064.36.35						
68	PERFORM ECS CHECK	E	II	064.57.00		REFER TO PO-1				
69	PERFORM EPS CHECK	E	II	064.57.24		REFER TO PO-2				
70	CONNECT BATTERY B TO BATTERY CHARGER	I	II	065.02.47						
71	ACTIVATE LOW RATE PCM	E	III	065.02.49			.9967			
72	RECORD DATA AT LOW SPEED	E	III	065.02.50			.9934			
73	TERM TRANS OF RECORDED DATA AND S-BAND	E	III	065.02.52			.9961			
74	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 2	N	III	065.03.54						
75	PREPARE LOWER EQUIPMENT BAY FOR USE	N	III	065.04.06						

LUNAR ORBIT COAST/LEM SEPARATION (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criti- cality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	
76	OBTAIN TOOL KIT FROM STORAGE	N	III	065.04.16							
77	START PRESSURIZATION OF TUNNEL AND LEM, LEB	N	II	065.04.47							
78	PREPARE, SERVE, AND EAT MEAL. CLEAN UP, LEB	N	III	065.06.08							
79	INGEST FOOD AND DRINK	CNE	III	065.14.13							
80	PERFORM PERSONAL HYGIENE	N	III	065.39.28							
81	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 1	C	III	065.41.06							
82	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	065.41.12							
83	PERFORM PERSONAL HYGIENE	C	III	065.41.21							
84	INGRESS TO LOWER EQUIPMENT BAY	N	III	065.52.15							
85	OBTAIN TOOL KIT FROM STORAGE	N	III	065.52.21							
86	PLACE OPTICS EYEPIECES IN STORAGE, LEB	N	III	065.52.51							
87	OPERATE S-BAND AT HIGH POWER	E	III	065.53.31							
88	PLAYBACK RECORDED DATA AT HIGH SPEED TO MSFN	E	III	065.53.39							
89	REMOVE SHELF AND OPTICS COVER FROM WORK SHELF POSITION	N	II	065.54.27							
90	INSTALL SHELF AND OPTICS COVER ON OPTICS MOUNTING PANEL	N	III	065.54.38							
91	REMOVE THERMAL BAGS FROM STORAGE	N	II	065.54.48							
92	PASS THERMAL BAGS TO SYSTEMS ENGINEER TO HOLD	N	III	065.55.18							
93	REMOVE COUCH 2 BACK PAD AND STOW IN PCA SUIT BAG	N	III	065.55.28							
94	ACTIVATE TAPE TRANSPORT TO WIND TAPE	E	III	065.55.44							
95	ACTIVATE HIGH RATE PCM DATA	E	III	065.55.45							
96	OBTAIN FROM STOWAGE AND DON THE UPPER THERMAL NEUTROD GARMENT	N	III	065.55.58							
97	OBTAIN AND DON TMG GLOVES	N	III	065.58.58							
98	ACTIVATE TUNNEL ILLUMINATION	C	III	065.59.28							

LUNAR ORBIT COAST/LEM SEPARATION (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	
99	RELEASE PRESSURE HATCH AND REMOVE FROM FITTINGS	N	II	065.59.28							
100	STOW CM PRESSURE HATCH IN COMMAND MODULE	N	III	065.59.33							
101	<u>PERFORM ECS CHECK</u>	E	II	066.00.00		REFER TO PO-1					
102	RELEASE THERMAL HATCH AND REMOVE FROM FITTINGS	N	III	066.00.03							
103	<u>PERFORM EPS CHECK</u>	E	II	066.00.24		REFER TO PO-2					
104	PLACE THERMAL HATCH IN THERMAL BAG AND STOW	N	III	066.02.03							
105	RELEASE DROGUE FROM TUNNEL FITTINGS	N	II	066.05.03							
106	REMOVE DROGUE FROM TUNNEL	N	II	066.05.33							
107	ACTIVATE VHF AM FOR VOICE COMM WITH LEM	E	II	066.05.47							.9960
108	CONNECT TRANSFER UMBILICAL TO PGA	E	II	066.05.49							
109	PLACE DROGUE IN THERMAL BAG	N	III	066.06.03							
110	STOW DROGUE IN COMMAND MODULE	N	III	066.07.03							
111	RETRIEVE CM TRANSFER UMBILICAL FROM LEM	N	III	066.21.22							
112	DOFF UPPER THERMAL METEOROID GARMET	N	III	066.21.32							
113	DOFF THERMAL METEOROID GLOVES	N	III	066.22.32							
114	PREPARE THERMAL METEOROID GARMET FOR TRANSFER TO LEM	N	II	066.23.02							
115	OBTAIN LUNAR BOUND SCIENTIFIC EQUIPMENT FROM STOWAGE IN CM	N	II	066.24.02							
116	PREPARE LUNAR BOUND SCIENTIFIC EQUIPMENT FOR TRANSFER TO LEM	N	II	066.29.02							
117	PASS PLSS TO COMMANDER IN TUNNEL	N	II	066.49.13							
118	PASS EQUIPMENT TO COMMANDER IN TUNNEL	N	II	*	066.49.43						
119	RETRIEVE CM TRANSFER UMBILICAL FROM LEM	N	II	066.57.22							
120	STOW PROBE ELECTRICAL UMBILICALS	N	II	066.57.32							
121	REMOVE DROGUE FROM THERMAL STORAGE BAG	N	II	066.58.02							

LUNAR ORBIT COAST/LEM SEPARATION (CONTINUED)

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Rel	
122	PASS DROGUE TO LEM CREWMAN	N	II	066.59.02										
123	REMOVE SHELF AND OPTICS COVER FROM OPTICS MOUNTING PANEL	N	II	067.01.22										
124	INSTALL SHELF AND OPTICS COVER AS WORK SHELF	N	III	067.01.47										
125	INSTALL OPTICS, LEB	N	II	067.02.08										
126	INGRESS TO COUCH 3 FROM LOWER EQUIPMENT BAY	N	II	067.03.18										
127	PERFORM ECS CHECK	N	II	067.03.27										
128	PERFORM EPS CHECK	N	II	067.03.51										
129	PERFORM EPCS FUEL CELL OXYGEN PURGE	N	II	067.09.14										
130	CONNECT BATTERY C TO BATTERY CHARGER	N	II	067.15.29										
131	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 3	N	II	067.40.00										
132	PREPARE LOWER EQUIPMENT BAY FOR USE, LEB	N	II	067.40.09										
133	PREPARE ROTATIONAL CONTROLLER FOR USE, LEB	N	II	067.40.19										
134	PERFORM ACTIVATION OF G&N OPTICS POWER, LEB	N	II	067.40.59										
135	PERFORM IMU ALIGNMENT	N	II	067.41.24										
136	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	II	067.52.30										
137	DEACTIVATE TUNNEL LIGHTS CIRCUIT	N	III	067.52.39										
138	ORIENT FOR LUNAR LANDMARK NAV SIGHTINGS	N	II	067.52.41										
139	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 1	N	II	068.03.31										
140	PREPARE FOR LANDMARK NAVIGATION PROCEDURES, LEB	N	II	068.03.37										
141	PROGRAM CMC FOR LANDMARK NAV PROCEDURE, LEB	N	II	068.03.44										
142	PREPARE OPTICS FOR LANDMARK SIGHTING, LEB	N	II	068.04.10										
143	PERFORM LANDMARK SIGHTING ROUTINE, LEB	N	II	068.09.04										
	REFER TO PO-10.3													

LUNAR ORBIT COAST/LEM SEPARATION (CONTINUED)

No.	Task	Crew Member	Criti- cality	Mission Time	No.	Task	Rel	OTHER DATA			Page Ref
								A.I.R. Rel	Source	Rel	
MARTIN STUDY TASKS											
144	PLACE OPTICS EYEPIECES IN STORAGE, LEB	N	III	068.38.38							
145	RELEASE ALL FINAL DOCKING LATCHES	N	II	068.40.14							
146	REMOVE CM THERMAL HATCH FROM STOWAGE	N	III	068.42.14							
147	REMOVE CM THERMAL HATCH FROM THERMAL STORAGE BAG	N	III	068.42.29							
148	INSTALL CM THERMAL HATCH IN TUNNEL	N	II	068.42.44							
149	REMOVE CM PRESSURE HATCH FROM STOWAGE IN COMMAND MODULE	N	III	068.43.44							
150	INSTALL CM PRESSURE HATCH IN TUNNEL	N	II	068.43.59							
151	SET LEM PRESSURIZATION VALVE TO PRES- SURIZE CM TUNNEL FROM LEM	N	II	068.44.59							
152	STOW DROGUE, PROBE AND CM THERM HATCH BAGS, LOWER EQUIPMENT BAY	N	III	068.45.14							
153	PLACE THERMAL BAGS IN STORAGE	N	III	068.45.14							
154	INSTALL OPTICS, LEB	N	II	068.46.14							
155	INGRESS TO COUCH 1 FROM LOWER EQUIP- MENT BAY	N	III	068.47.24							
156	ORIENT FOR LEM IMU ALIGNMENT	N	II	068.47.33							
157	ENTER CMC IDLING PROGRAM CODE INTO CMC	N	II	068.56.00				.9690			
158	ORIENT FOR CSM/LEM SEPARATION	N	II	068.56.02							
159	ACTIVATE DOCKING TARGET CIRCUIT	N	II	069.01.42				.9962			

SOLO LUNAR ORBIT/LEM DOCKING

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA			
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Page Ref
1	ACTIVATE CSM/LEM SEPARATION SEQUENCER ARMING CIRCUIT	N	II	069.05.31				.9969					
2	ACTIVATE DOCKING PROBE EXTEND CIRCUIT	N	II	069.05.33				.9962					
3	MONITOR PROBE EXTEND/RELEASE TALKBACK INDICATES PROPER OPERATION	N	III	069.05.35				.9964					
4	ACTIVATE PROBE SEQUENCER ARMING CIRCUIT	N	II	069.05.45				.9969					
5	ACTIVATE DOCKING PROBE PRIMARY 2 RETRACTION CIRCUIT	N	II	069.05.47				.9967					
6	ACTIVATE DOCKING PROBE SECONDARY 2 RETRACTION CIRCUIT	N	II	069.05.49				.9967					
7	COORDINATE ACTIVITY WITH LEM	N	III	069.06.51									
8	ORIENT FOR HGA RR TRANSPON , AND OPTIC TRACK OF LEM	N	II	069.28.40									
9	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 1	N	III	069.34.56									
10	ACTIVATE G&N POWER OPTICS	N	II	069.35.02				.9985					
11	PROGRAM CMC	N	II	069.35.03				.9464					
12	OPEN ASTRO-SEXTANT DOORS	N	II	069.35.25									
13	SIGHT THROUGH SCT AND TRACK LEM	N	II	069.35.35									
14	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	070.26.00									
15	DEACTIVATE ATTITUDE HOLD IN THE REQUIRED CHANNEL(S)	N	II	070.27.16									
16	ESTABLISH REQUIRED RATE(S) USING MANUAL DIRECT ATTITUDE CONTROL	N	II	070.27.26									
17	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 1	N	III	070.30.26									
18	SIGHT THROUGH SCT AND TRACK LEM	N	II	070.30.32									
19	ENTER CMC IDLING PROGRAMMING CODE	N	II	070.41.00				.9690					
20	DEACTIVATE G&N POWER OPTICS	N	II	070.41.02				.9985					
21	DEACTIVATE G&N POWER IMU	N	II	070.41.03				.9985					
22	ENTER VERB--NOUN, PREPARE FOR STANDBY	N	II	070.41.04				.9539					
23	ACTIVATE CMC STANDBY	N	II	070.41.06				.9922					
24	SECURE LEB	N	III	070.41.07									

SOLO LUNAR ORBIT/LEM DOCKING (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	
25	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	070.41.29							
26	ACTIVATE ATTITUDE CHANNEL(S)	N	II	070.43.02							
27	ACTIVATE SCS SC CONTROL	N	II	070.43.07							
28	INGRESS TO COUCH 3 FROM LOWER EQUIPMENT BAY	N	III	070.43.08							
29	PERFORM ECS CHECK	N	II	070.43.17				REFER TO PO-1			
30	PERFORM EPS CHECK	N	II	070.43.41				REFER TO PO-2			
31	PERFORM EPS FUEL CELL H ₂ PURGE	N	II	070.49.04				REFER TO PO-4			
32	INGRESS TO LOWER EQUIPMENT BAY	N	III	070.53.49							
33	INGRESS TO COUCH LEFT HAND SIDE, SHOCK ATTENUATOR PANELS, LOWER EQUIPMENT BAY	N	II	070.53.58							
34	PERFORM ECS MAINTENANCE, LEB	N	II	070.54.11				REFER TO PO-3			
35	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH LEFT HAND SIDE SHOCK ATTENUATOR PANELS	N	III	070.57.32							
36	PREPARE AND EAT MEAL AND CLEAN UP LEB	N	II	070.57.45							
37	PERFORM PERSONAL HYGIENE	N	III	071.30.45							
38	INGRESS TO COUCH 3 FROM LOWER EQUIPMENT BAY	N	III	071.41.08							
39	PERFORM ECS CHECK	N	II	071.41.17				REFER TO PO-1			
40	PERFORM EPS CHECK	N	II	071.41.41				REFER TO PO-2			
41	CHECK SPS CONTROLS AND DISPLAYS	N	III	071.47.05				REFER TO PO-8			
42	INGRESS TO COUCH 1 FROM COUCH 3	N	III	071.47.20							
43	PERFORM DISPLAYS CHECK OF SM RCS	N	III	071.47.32				REFER TO PO-7			
44	VERIFY STATUS OF CM UNPRESS RCS	N	II	071.48.30				REFER TO PO-6			
45	ACTIVATE BOTH HAND CONTROL POWER	N	II	071.49.45							
46	LOCK ROTATIONAL CONTROLLER NR 2	N	II	071.49.46							
47	INGRESS TO LOWER EQUIPMENT BAY FOR USE, LEB	N	III	071.49.50							
48	PREPARE LOWER EQUIPMENT BAY FOR USE, LEB	N	III	071.49.56							
49	PREPARE LEB AND ROTATIONAL CONTROL	N	II	071.50.06							
50	SET G/N POWER IMU SWITCH TO ON	N	II	071.50.46							.9985

SOLO LUNAR ORBIT/LEM DOCKING (CONTINUED)

No.	Task	Crew Member	Cri- ciality	Mission Time	No.	Task	Rel	OTHER DATA			Page Ref
								A.I.R. Rel	Source	Rel	
AMPTF DMR II TASKS											
51	DEACTIVATE CMC STANDBY MODE	N	II	071.50.47							.9960
52	PERFORM CAUTION AND WARNING SYSTEM TEST, LOWER EQUIPMENT BAY	N	II	071.50.48							.9973
53	PREPARE FOR IMU COARSE ALIGNMENT, LEB	N	II	071.53.56							
54	<u>PERFORM IMU ALIGNMENT</u>			071.55.02							
55	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	072.12.45							
56	SELECT CMC AS FDAI SOURCE	N	II	072.12.54							.9960
57	DEACTIVATE LIMIT CYCLE	N	II	072.12.56							.9971
58	ACTIVATE CMC SC CONTROL	N	II	072.12.57							.9969
59	SELECT CSM LOCAL ATTITUDE HOLD PROGRAM	N	II	072.12.58							
60	PROGRAM CMC	N	II	072.12.59							.9464
61	ENTER CSM X-AXIS PITCH ANGLE	N	II	072.13.21							.9690
62	MONITOR FDAI DURING LOCAL ATTITUDE HOLD	N	II	072.13.23		1.16D FDAI ALIGN					
63	ORIENT FOR LUNAR LANDMARK NAV. SIGHTINGS	N	II	072.14.03							.250 .9525
64	INGRESS TO LOWER EQUIPMENT BAY	N	III	072.31.33							
65	PREPARE FOR LANDMARK NAVIGATION PROCEDURE, LEB	N	II	072.31.39							
66	<u>PERFORM LUNAR LANDMARK SIGHTING</u>			072.39.08							
67	DEACTIVATE G&N POWER OPTICS	N	II	072.44.33							.9985
68	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	072.44.34							
69	ORIENT TO SLEEP CYCLE ATTITUDE	N	III	072.44.43							
70	DEACTIVATE H.C. NR 2 POWER	N	II	073.02.13							
71	SELECT GDC FOR FDAI SOURCE	N	II	073.02.15							.9960
72	ACTIVATE LIMIT CYCLE	N	II	073.02.16							.9971
73	ACTIVATE SCS SC CONTROL	N	II	073.02.17							.9969
74	LOCK ROTATIONAL CONTROLLER NR 2	N	II	073.02.18							
75	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 1	N	III	073.02.23							
76	DEACTIVATE G&N POWER IMU	N	II	073.02.29							.9985

SOLO LUNAR ORBIT/LEM DOCKING (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			
		Crew Member	Crit.- ality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source
77	ENTER VERB-NOUN, PREPARE FOR STANDBY	N	II	073.02.30				.9959			
78	ACTIVATE CMC STANDBY	N	II	073.02.32				.9922			
79	INGRESS TO COUCH 3 FROM LOWER EQUIPMENT BAY	N	III	073.02.33							
80	<u>PERFORM ECS CHECK</u>	N	II	073.02.42		REFER TO PO-1					
81	<u>PERFORM EPS CHECK</u>	N	II	073.03.06		REFER TO PO-2		.9967			
82	ACTIVATE LOW RATE PCM	N	II	073.16.46							
83	RECORD LO DATA RATE PCM FOR FAST PLAYBACK	N	III	073.16.46				.9961			
84	DEACTIVATE TAPE RECORDER	N	II	073.16.48				.9961			
85	PLACE S-BAND TAPE/ANALOG SWITCH TO CENTER POSITION	N	II	073.17.48				.9958			
86	DEACTIVATE S-BAND POWER AMPL	N	II	073.17.51				.9961			
87	SLEEP	N	II	073.17.51							
88	AWAKEN	N	II	076.00.00							
89	<u>PERFORM EPS FUEL CELL O₂ PURGE</u>	N	II	076.00.00		REFER TO PO-5					
90	SLEEP	N	III	076.06.15							
91	AWAKEN	N	II	079.00.00							
92	<u>PERFORM ECS CHECK</u>	N	II	079.00.00		REFER TO PO-1					
93	<u>PERFORM EPS CHECK</u>	N	II	079.00.24		REFER TO PO-2					
94	<u>CHECK SPS CONTROLS AND DISPLAYS</u>	N	III	079.05.47		REFER TO PO-8					
95	<u>PERFORM EPS FUEL CELL H₂ PURGE</u>	N	II	079.06.02		REFER TO PO-4					
96	DETERMINE CHARGE STATUS OF BATTERIES A, B, AND C	N	III	079.10.47							
97	INGRESS TO COUCH 1 FROM COUCH 3	N	III	079.10.57							
98	<u>PERFORM DISPLAYS CHECK OF SM RCS</u>	N	III	079.11.09		REFER TO PO-7					
99	VERIFY STATUS OF CM UNPRESS RCS	N	III	079.12.07		REFER TO PO-6					
100	ACTIVATE BOTH HAND CONTROL POWER	N	II	079.13.23							
101	LOCK ROTATIONAL CONTROLLER NR 2	N	II	079.13.24							
102	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 1	N	III	079.13.28							

SOLO LUNAR ORBIT/LEM DOCKING (CONTINUED)

No.	Task	AMPTF DRW II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel.	A.I.R.	Rel.	Source	Rel.	Source	Rel.	
103	PREPARE SNACK, EAT, AND CLEAN UP LEB	N	III	079.13.34										
104	PERFORM PERSONAL HYGIENE	N	III	079.33.20										
105	OBTAIN PGA FROM STORAGE	N	II	079.38.28										
106	DON PGA	N	II	079.38.58										
107	PREPARE LOWER EQUIPMENT BAY FOR USE, LEB	N	III	079.43.29										
108	PREPARE LEB AND ROTATIONAL CONTROL FOR USE, LEB	N	II	079.43.39										
109	SET G/N IMU SWITCH TO ON	N	II	079.44.19										.9985
110	<u>PERFORM IMU ALIGNMENT</u>	N	II	079.48.35										REFER TO PO-9
111	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	080.06.18										
112	SELECT CMC AS FD/AI SOURCE	N	II	080.06.27										.9960
113	DEACTIVATE LIMIT CYCLE	N	II	080.06.29										.9971
114	ACTIVATE CMC SC CONTROL	N	II	080.06.30										.9969
115	ESTABLISH CSM LOCAL ATTITUDE HOLD MODE	N	II	080.06.31										
116	ORIENT FOR LUNAR LANDMARK NAV. SIGHTINGS	N	II	080.07.36										
117	INGRESS TO LOWER EQUIPMENT BAY	N	III	080.18.26										
118	PREPARE FOR LANDMARK NAV. PROCEDURE, LEB	N	III	080.18.32										
119	<u>PERFORM LUNAR LANDMARK SIGHTING</u>	N	III	080.23.50										REFER TO PO-10.3
120	INGRESS TO COUCH 1	N	III	080.34.15										
121	ORIENT TO INSURE COMMUNICATIONS	N	II	080.34.24										
122	ENTER CMC IDLING PROGRAM CODE INTO CMC	N	II	080.45.14										.9690
123	ACTIVATE SCS SC CONTROL	N	II	080.45.16										.9969
124	PREPARE G+C FOR SCS ATTITUDE HOLD	N	II	080.45.17										
125	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 1	N	III	080.45.27										
126	DEACTIVATE G+N POWER INU	N	II	080.45.33										.9985
127	SELECT CMC STANDBY MODE, LOWER EQUIPMENT BAY	N	II	080.45.34										.9464

SOLO LUNAR ORBIT/LEM DOCKING (CONTINUED)

No.	Task	Crew Member	Criti-cality	Mission Time	No.	Task	Rel	MARTIN STUDY TASKS			OTHER DATA			Page Ref
								A.I.R. Rel	Source	Rel	Source	Rel	Rel	
128	INGRESS TO COUCH 3 FROM LOWER EQUIPMENT BAY	N	III	080.45.37										
129	<u>PERFORM ECS CHECK</u>	N	II	081.16.00		REFER TO PO-1								
130	<u>PERFORM EPS CHECK</u>	N	II	081.16.24		REFER TO PO-2								
131	ACTIVATE LOW RATE PCM	N	II	081.26.31										
132	RECORD LO DATA RATE PCM FOR FAST PLAYBACK	N	III	081.26.31										
133	TERM TRANS OF RECORD DATA AND DEACT S-BAND AMPL	N	II	081.26.33										
134	DOWN LINK TELEM DATA	N	II	081.12.47										
135	<u>PERFORM ECS CHECK</u>	N	II	082.15.04		REFER TO PO-1								
136	<u>PERFORM EPS CHECK</u>	N	II	082.15.28		REFER TO PO-2								
137	DEACTIVATE TAPE RECORDER	N	II	082.20.52										
138	<u>PERFORM ECS CHECK</u>	N	II	083.18.00		REFER TO PO-1								
139	<u>PERFORM EPS CHECK</u>	N	II	083.18.24		REFER TO PO-2								
140	<u>PERFORM EPS FUEL CELL O₂ PURGE</u>	N	II	083.23.47		REFER TO PO-5								
141	ACTIVATE LOW RATE PCM	N	II	083.28.54										
142	RECORD LO DATA RATE PCM FOR FAST PLAYBACK	N	III	083.28.54										
143	TERM TRANS OF RECORD DATA AND DEACT S-BAND AMPL	N	II	083.28.56										
144	DOWN LINK TELEMETRY DATA	N	II	084.15.11										
145	<u>PERFORM ECS CHECK</u>	N	II	084.17.27		REFER TO PO-1								
146	<u>PERFORM EPS CHECK</u>	N	II	084.17.51		REFER TO PO-2								
147	<u>CHECK SPS CONTROLS AND DISPLAYS</u>	N	III	084.23.15		REFER TO PO-8								
148	INGRESS TO COUCH 3 FROM COUCH 1	N	III	084.23.30										
149	<u>PERFORM DISPLAYS CHECK OF SM RCS</u>	N	III	084.23.42		REFER TO PO-7								
150	<u>VERIFY STATUS OF CMI UNPRESS RCS</u>	N	III	084.24.40		REFER TO PO-6								
151	INGRESS TO LOWER EQUIPMENT BAY	N	III	084.25.55										
152	PREPARE MEAL, EAT, AND CLEAN UP LEB	N	III	084.26.01										
153	PERFORM PERSONAL HYGIENE, LEB	N	III	084.59.01										

SOLO LUNAR ORBIT/LLEM DOCKING (CONTINUED)

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Rel	
154	INGRESS TO COUCH 3 FROM LOWER EQUIPMENT BAY	N	III	085.09.54										
155	PERFORM ECS CHECK	N	II	085.21.00				REFER TO PO-1						
156	<u>PERFORM EPS CHECK</u>	N	II	085.21.24				REFER TO PO-1						
157	ACTIVATE LOW RATE PCM	N	II	085.31.16										
158	RECORD LO DATA RATE PCM FOR FAST PLAYBACK	N	III	085.31.16										
159	TERM TRANS OF RECORD DATA AND DEACT S-BAND AMPL	N	II	085.31.18										
160	PERFORM ECS CHECK	N	II	085.50.00				REFER TO PO-1						
161	<u>PERFORM EPS CHECK</u>	N	II	085.50.24				REFER TO PO-2						
162	<u>PERFORM EPS FUEL CELL H₂ PURGE</u>	N	II	085.55.47				REFER TO PO-4						
163	INGRESS TO COUCH 1 FROM COUCH 3	N	III	086.00.32										
164	PERFORM INITIAL G + C PREPARATIONS	N	II	086.00.44										
165	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 1	N	III	086.00.49										
166	PREPARE LOWER EQUIPMENT BAY FOR USE, LEB	N	III	086.00.55										
167	PREPARE LEB AND ROTATIONAL CONTROL FOR USE	N	II	086.01.05										
168	<u>PERFORM IMU ALIGNMENT</u>	N	III	086.06.01				REFER TO PO-9						
169	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	086.23.44										
170	PERFORM FINAL G + C PREPARATIONS	N	II	086.23.53										
171	ESTABLISH CSM LOCAL ATTITUDE HOLD MODE	N	II	086.23.57										
172	ORIENT FOR LUNAR LANDMARK NAV. SIGHTINGS	N	II	086.25.02										
173	<u>PERFORM LUNAR LANDMARK SIGHTING</u>	N	II	086.41.09				REFER TO PO-10.3						
174	ENTER CMC DLING PROGRAM CODE INTO CMC	N	II	086.46.43										.9690
175	ORIENT TO INSURE COMMUNICATIONS	N	II	086.46.45										
176	ACTIVATE SCS SC CONTROL	N	II	086.57.35										.9969
177	PREPARE G + C FOR SCS ATTITUDE HOLD	N	II	086.57.36										

SOLO LUNAR ORBIT/LEM DOCKING (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA		
		Crew Member	Crit. Cality	Mission Time	No.	Task	Rel	Source	Rel	Source
178	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 1	N	III	086.57.46						
179	DEACTIVATE G+N POWER IMU	N	II	086.57.52						
180	SELECT CMC STANDBY MODE , LOWER EQUIPMENT BAY	N	II	086.57.53						
181	INGRESS TO COUCH 3 FROM LOWER EQUIPMENT BAY	N	III	086.57.56						
182	<u>PERFORM ECS CHECK</u>	N	II	087.23.00				REFER TO PO-1		
183	<u>PERFORM EPS CHECK</u>	N	II	087.23.24				REFER TO PO-2		
184	ACTIVATE LOW RATE PCM	N	II	087.33.40						
185	RECORD LO DATA RATE PCM FOR FAST PLAYBACK	N	III	087.33.40						
186	TERM TRANS OF RECORDED DATA AND DEACT S-BAND AMPLIFIER	N	II	087.33.42						
187	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 3	N	III	087.34.45						
188	PREPARE AND EAT MEAL AND CLEANUP LEB	N	III	087.34.54						
189	PERFORM PERSONAL HYGIENE LEB	N	III	088.07.54						
190	INGRESS TO COUCH 3 FROM LOWER EQUIPMENT BAY	N	III	088.09.32						
191	DOWN LINK TELEM DATA	N	II	088.19.58						
192	<u>PERFORM ECS CHECK</u>	N	II	088.22.15				REFER TO PO-1		
193	<u>PERFORM EPS CHECK</u>	N	II	088.22.39				REFER TO PO-2		
194	<u>CHECK SPS CONTROLS AND DISPLAYS</u>	N	III	088.28.03				REFER TO PO-8		
195	<u>PERFORM EPS FUEL CELL O₂ PURGE</u>	N	II	088.28.18				REFER TO PO-5		
196	INGRESS TO COUCH 1	N	III	088.34.33						
197	<u>PERFORM DISPLAYS CHECK OF SM RCS</u>	N	II	088.34.45				REFER TO PO-7		
198	INGRESS TO COUCH 3	N	III	088.35.42						
199	DEACTIVATE TAPE RECORDER	N	II	088.35.54						
200	<u>PERFORM ECS CHECK</u>	N	II	089.26.00				REFER TO PO-1		
201	<u>PERFORM EPS CHECK</u>	N	II	089.26.24				REFER TO PO-2		
202	ACTIVATE LOW RATE PCM	N	II	089.36.03						

SOLO LUNAR ORBIT/LEM DOCKING (CONTINUED)

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Ref	A.I.R. Rel	Source	Rel.	Source	Rel.	Page Ref	
203	RECORD LO DATA RATE PCM FOR FAST PLAYBACK	N	III	089.36.03				.9961						
204	TERM TRANS OF DATA AND DEACT S-BAND AMPL	N	II	089.36.05				.9921						
205	DOWN LINK TELE DATA	N	II	090.22.20										
206	PERFORM ECS CHECK	N	II	090.24.36										
207	PERFORM EPS CHECK	N	II	090.25.00										
208	PERFORM ECS CHECK	N	II	091.28.00										
209	PERFORM EPS CHECK	N	II	091.28.24										
210	ACTIVATE LOW RATE PCM	N	II	091.38.26										
211	RECORD LO DATA RATE PCM FOR FAST PLAYBACK	N	III	091.38.26										
212	TERM TRANS OF RECORD DATA AND DEACT S-BAND AMPL	N	II	091.38.28										
213	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 3	N	III	091.39.31										
214	PREPARE AND EAT MEAL AND CLEAN UP	N	III	091.39.40										
215	PERFORM PERSONAL HYGIENE	N	III	092.12.40										
216	INGRESS TO COUCH 3 FROM COUCH 1	N	III	092.14.18										
217	PERFORM EPS FUEL CELL H ₂ PURGE	N	II	092.14.30										
218	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 3	N	III	092.19.15										
219	PERFORM ECS CHECK	N	II	092.19.24										
220	PERFORM EPS CHECK	N	II	092.19.48										
221	CHECK SPS CONTROLS AND DISPLAYS	N	III	092.25.11										
222	INGRESS TO COUCH 1 FROM COUCH 3	N	III	092.25.26										
223	PERFORM DISPLAYS CHECK OF SM RCS	N	III	092.25.38										
224	PERFORM INITIAL G+C PREPARATIONS	N	II	092.10.00										
225	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 1	N	III	092.10.05										
226	PREPARE LEB AND ROTATIONAL CONTROL FOR USE	N	III	092.10.21										
227	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	092.27.48										

SOLO LUNAR ORBIT/LEM DOCKING (CONTINUED)

No.	Task	AMP/TF DRW II TASKS				MARTIN STUDY TASKS				OTHER DATA			
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Page Ref
228	SELECT CSM LOCAL ATTITUDE HOLD MODE	N	II	092.27.57									
229	ORIENT FOR LUNAR LANDMARK NAV. SIGHTINGS	N	II	092.29.02									
230	<u>PERFORM LUNAR LANDMARK NAV.</u> <u>SIGHTING</u>			092.49.30		REFER TO PO-10.3							
231	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	093.09.10									
232	TERMINATE CSM LOCAL ATTITUDE HOLD MODE	N	II	093.09.19									
233	ORIENT TO SLEEP CYCLE ATTITUDE	N	III	093.09.21									
234	ESTABLISH SCS INERTIAL ATTITUDE HOLD	N	II	093.26.51									
235	PREPARE G+C FOR SCS ATTITUDE HOLD	N	II	093.26.52									
236	INGRESS TO LOWER EQUIPMENT BAY	N	III	093.27.02									
237	DEACTIVATE G+N POWER DNU	N	II	093.27.08									
238	SELECT CMC STANDBY MODE, LOWER EQUIPMENT BAY	N	II	093.27.09									
239	INGRESS TO COUCH 3 FROM LOWER EQUIPMENT BAY	N	III	093.27.12									
240	PERFORM ECS CHECK	N	II	093.27.21		REFER TO PO-1							
241	<u>PERFORM EPS CHECK</u>	N	II	093.27.45		REFER TO PO-2							
242	DETERMINE CHARGE STATUS OF BATTERIES A, B, AND C	N	III	093.33.08									
243	ACTIVATE LOW RATE PCM	N	II	093.40.49									
244	RECORD LO DATA RATE PCM FOR FAST PLAYBACK	N	III	093.40.49									
245	TERM TRANS OF RECORD DATA AND DEACT S-BAND AMPL	N	II	093.40.51									
246	SLEEP	N	III	093.41.53									
247	AWAKEN	N	II	096.00.00									
248	<u>PERFORM EPS FUEL CELL O₂ PURGE</u>	N	II	096.00.00		REFER TO PO-5							
249	SLEEP	N	III	096.06.15									
250	AWAKEN	N	II	099.10.00									
251	<u>PERFORM ECS CHECK</u>	N	II	099.10.00		REFER TO PO-1							
252	PERFORM EPS CHECK	N	II	099.10.24		REFER TO PO-2							

SOLO LUNAR ORBIT/LLEM DOCKING (CONTINUED)

No.	AMP/TF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA			
	Task	Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel
253	PERFORM EPS FUEL CELL H ₂ PURGE	N	II	099.15.47		REFER TO PO-4						
254	<u>CHECK SPS CONTROLS AND DISPLAYS</u>	N	III	099.20.32		REFER TO PO-8						
255	DETERMINE CHARGE STATUS OF BATTERIES A, B, AND C	N	II	099.20.47								
256	INGRESS TO COUCH 1 FROM COUCH 3	N	II	099.20.57								
257	PERFORM DISPLAYS CHECK OF SM RCS	N	II	099.21.09								
258	<u>VERIFY STATUS OF CM UNPRESS RCS</u>	N	II	099.22.07								
259	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 1	N	II	099.23.23								
260	DOFF AND STOW PGA, LOWER EQUIPMENT BAY	N	II	099.23.29								
261	PERFORM PERSONAL HYGIENE, LEB	N	II	099.28.14								
262	OBTAIN AND DON PGA, LOWER EQUIP BAY	N	II	099.32.52								
263	PREPARE AND EAT MEAL AND CLEAN UP LEB	N	II	099.37.53								
264	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	II	100.10.53								
265	PERFORM INITIAL G+C PREPARATIONS	N	II	100.11.02								
266	INGRESS TO LOWER EQUIP BAY FROM COUCH 1	N	II	100.11.07								
267	PREPARE LOWER EQUIP BAY FOR USE, LEB	N	II	100.11.13								
268	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	II	100.34.02								
269	ESTABLISH CSM LOCAL ATTITUDE HOLD MODE	N	II	100.36.00								
270	ORIENT FOR LUNAR LANDMARK NAV. SIGHTINGS	N	II	100.37.05								
271	<u>PERFORM LUNAR LANDMARK NAV. SIGHTING.</u>			100.48.08								
272	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	II	101.03.36								
273	ENTER CMC IDLING PROGRAM CODE INTO CMC	N	II	101.03.45								
274	ORIENT TO INSURE COMMUNICATIONS	N	II	101.03.47								
275	ACTIVATE ATTITUDE CHANNEL(S)	N	II	101.21.17								
276	INGRESS TO COUCH 3 FROM COUCH 1	N	II	101.21.22								
277	PERFORM ECS CHECK	N	II	101.21.34								
												*9690

SOLO LUNAR ORBIT/LFM DOCKING (CONTINUED)

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA			
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Page Ref
278	<u>PERFORM EPS CHECK</u>	N	II	101.21.58		REFER TO PO-2							
279	<u>PERFORM ECS CHECK</u>	N	II	101.40.00		REFER TO PO-1							
280	<u>PERFORM EPS CHECK</u>	N	II	101.40.24		REFER TO PO-2							
281	INGRESS TO LOWER EQUIP BAY FROM COUCH 3	N	III	101.45.47									
282	INGRESS TO COUCH LEFT HAND SIDE SHOCK ATTENUATOR PANELS, LOWER EQUIP BAY	N	III	101.45.56									
283	<u>PERFORM ECS MAINTENANCE, LEB</u>	N	II	101.46.09		REFER TO PO-3							
284	INGRESS TO LOWER EQUIP BAY FROM COUCH LEFT HAND SIDE SHOCK ATTENUATOR PANELS	N	III	101.49.30									
285	INGRESS TO COUCH 3 FROM LOWER EQUIPMENT BAY	N	III	101.49.43									
286	DOWN LINK TELEM DATA	N	II	102.36.41									
287	<u>PERFORM ECS CHECK</u>	N	II	102.38.56		REFER TO PO-1							
288	<u>PERFORM EPS CHECK</u>	N	II	102.39.20		REFER TO PO-2							
289	<u>PERFORM EPS FUEL CELL O₂ PURGE</u>	N	II	102.44.44		REFER TO PO-5							
290	DEACTIVATE TAPE RECORDER	N	II	102.50.59									
291	INGRESS TO LOWER EQUIP BAY FROM COUCH 3	N	III	102.51.59									
292	TURN ON RADAR TRANSPONDER	N	II	102.52.08									
293	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	102.52.10									
294	ORIENT FOR RENDEZ RADAR XPONDER POINTING	N	II	102.58.14									
295	ESTABLISH ATT RATE FOR LEM TRACKING	N	II	103.08.14									
296	ACTIVATE ATTITUDE CHANNEL(S)	N	II	103.22.27									
297	INGRESS TO LOWER EQUIP BAY FROM COUCH 1	N	III	103.22.32									
298	PREPARE MEAL, EAT, AND CLEAN UP LEB	N	III	103.22.38									
299	PERFORM PERSONAL HYGENE, LEB	N	III	103.55.38									
300	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	104.06.31									
301	<u>PERFORM DISPLAYS CHECK OF SM RCS</u>	N	III	104.06.40		REFER TO PO-7							

SOLO LUNAR ORBIT/LEM DOCKING (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	Source	Rel	Source	
302	INGRESS TO COUCH 3 FROM COUCH 1	N	III	104.07.38							
303	<u>PERFORM ECS CHECK</u>	N	II	104.07.50		REFER TO PO-1					
304	<u>PERFORM EPS CHECK</u>	N	II	104.08.14		REFER TO PO-2					
305	<u>CHECK SPS CONTROLS AND DISPLAYS</u>	N	III	104.13.37		REFER TO PO-8					
306	INGRESS TO COUCH 1 FROM COUCH 3	N	III	104.13.52							
307	PERFORM INITIAL G+C PREPARATIONS	N	II	104.10.00		NOTE: TIME OVERLAP					
308	INGRESS TO LOWER EQUIP BAY FROM COUCH 1	N	III	104.10.05							
309	PREPARE LOWER EQUIP BAY FOR USE	N	III	104.10.11							
310	<u>PERFORM IMU ALIGNMENT</u>			104.15.17		REFER TO PO-9					
311	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	104.32.50							
312	ESTABLISH CSM LOCAL ATTITUDE HOLD MODE	N	II	104.32.59							
313	ORIENT FOR LUNAR LANDMARK	N	II	104.37.00							
314	<u>PERFORM LUNAR LANDMARK NAV.</u>			104.53.00		REFER TO PO-10.3					
315	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	104.57.33							
316	ORIENT FOR HGA, RR TRANSPOND + OPTIC TRACK OF LEM	N	II	104.58.00							
317	ESTABLISH ATTITUDE RATE FOR LEM TRACKING	N	II	105.05.30							
318	INGRESS TO LOWER EQUIP BAY FROM COUCH 1	N	III	105.08.40							
319	PREPARE FOR LEM TRACKING, LEB	N	II	105.36.00							
320	INGRESS TO COUCH 3 FROM LOWER EQUIPMENT BAY	N	III	105.52.22							
321	SELECT LOW RATE PCM DATA AND RECORD	N	III	105.55.08							
322	<u>PERFORM ECS CHECK</u>	N	II	105.56.12		REFER TO PO-1					
323	<u>PERFORM EPS CHECK</u>	N	II	105.56.36		REFER TO PO-2					
324	INGRESS TO COUCH 1 FROM COUCH 3	N	III	106.02.00							
325	ORIENT FOR IMU ALIGNMENT	N	II	106.07.00							
326	INGRESS TO LOWER EQUIP BAY FROM COUCH 1	N	III	106.10.00							

SOLO LUNAR ORBIT/LEM DOCKING (CONTINUED)

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Rel	
327	PREPARE LOWER EQUIP BAY FOR USE, LEB	N	III	106.10.06										
328	<u>PERFORM IMU ALIGNMENT</u>			106.13.32										
329	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	106.24.26										
330	ORIENT FOR HGA, RR TRANSPOND + OPTIC TRACK OF LEM	N	II	106.24.45										
331	INGRESS TO COUCH 3 FROM COUCH 1	N	III	106.30.15										
332	<u>PERFORM EPS FUEL CELL H₂ PURGE</u>	N	II	106.30.27										
333	INGRESS TO LOWER EQUIP BAY FROM COUCH 3	N	III	106.35.12										
334	PREPARE FOR LEM TRACKING, LEB	N	II	106.35.21										
335	INGRESS TO COUCH 1 FROM LOWER EQUIPMENT BAY	N	III	106.41.35										
336	ORIENT FOR LEM TRACKING	N	II	107.07.38										
337	INGRESS TO COUCH 3 FROM LOWER EQUIPMENT BAY	N	III	107.39.37										
338	<u>PERFORM ECS CHECK</u>	N	II	107.39.46										
339	<u>PERFORM EPS CHECK</u>	N	II	107.40.10										
340	INGRESS TO COUCH 1 FROM COUCH 3	N	III	107.45.33										
341	ORIENT SC USING INERTIAL ATTITUDE INDICATORS AND MANTAIN ACTIVE MANUAL CONTROL	N	II	107.41.15										
342	MONITOR PROBE EXTEND/RELEASE TALKBACK INDICATES PROPER OPERATION	N	III	107.56.35										.9964
343	DEACTIVATE SEQUENCER ARMING CIRCUIT	N	II	107.56.45										.9969
344	DEACTIVATE DOCKING PROBE PRIMARY 2 RETRACTION CIRCUIT	N	II	107.56.47										.9967
345	DEACTIVATE DOCKING PROBE SECONDARY 2 RETRACTION CIRCUIT	N	II	107.56.49										.9967
346	ACTIVATE TUNNEL LIGHTS CIRCUIT	N	III	107.56.51										.9967
347	DEACTIVATE EXTERIOR LIGHTS CIRCUIT	N	II	107.56.53										.9967
348	DEACTIVATE DOCKING TARGET CIRCUIT	N	II	107.56.55										.9958
349	INGRESS TO LOWER EQUIPMENT BAY FROM COUCH 1	N	III	107.56.57										

SOLO LUNAR ORBIT/LEM DOCKING (CONTINUED)

No.	Task	AMP/TF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA		
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel
350	MONITOR TUNNEL PRESSURE GAGE—NOTE— APPROX TEN MINUTES	N	III	107.57.03						
351	REMOVE THERMAL BAG FROM STORAGE	N	II	107.57.03						
352	OBTAIN AND DON THERMAL GARMENT TO PROTECT PGA	N	II	107.58.03						
353	OBTAIN TOOL KIT FROM STORAGE	N	III	108.01.03						
354	PLACE OPTICS EYEPIECES IN STORAGE, LEB	N	III	108.01.33						
355	REMOVE SHELF AND OPTICS COVER FROM WORK SHELF POSITION	N	III	108.03.09						
356	INSTALL SHELF AND OPTICS COVER ON OPTICS MOUNTING PANEL	N	III	108.03.19						
357	RELEASE PRESSURE HATCH AND REMOVE FROM FITTINGS	N	II	108.03.30						
358	STOW CM PRESSURE HATCH IN COMMAND MOD.	N	III	108.03.35						
359	RELEASE THERMAL HATCH AND REMOVE FROM FITTINGS	N	II	108.04.05						
360	PLACE THERMAL HATCH IN THERMAL BAG AND STOW	N	III	108.06.05						
361	CLOSE AND SECURE ALL FINAL DOCKING LATCHES	N	II	108.09.05						
362	ASSIST TO REMOVE PROBE	N	II	108.12.05						
363	STOW PROBE ELECTRICAL UMBILICALS IN LEM	N	III	108.17.05						
364	PASS TRANSFER UMBILICAL TO LEM	N	II	108.17.35						

LUNAR ORBIT/LEM JETTISON

No.	Task	AMP/T FF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA			
		Crew Member	Civi- ality	Mission Time	No.	Task	Ref	A.I.R. Ref	Source	Rel	Source	Rel	Page Ref
1	STOW SCIENTIFIC EQUIPMENT IN CM	N	III	108, 27.50									
2	PASS PLSS TO COMMANDER IN TUNNEL	N	III	108, 27.52									
3	PASS EQUIPMENT TO COMMANDER IN TUNNEL	N	III	108, 28.22									
4	PASS TRANSFER UNBILICAL TO LEM	N	III	108, 32.52									
5	REMOVE CM PRESSURE HATCH FROM STOWAGE IN COMMAND MODULE	N	III	108, 33.07									
6	REMOVE CM THERMAL HATCH FROM THERMAL STORAGE BAG	N	III	108, 33.22									
7	PASS THERMAL HATCH TO SYSTEMS ENGINEER	N	III	108, 33.37									
8	REMOVE CM PRESSURE LEB HATCH FROM STOWAGE IN COMMAND MODULE	N	III	108, 33.47									
9	INSTALL CM PRESSURE HATCH IN TUNNEL	N	II	108, 34.02									
10	SET LEM PRESSURIZATION VALVE TO VENT CM TUNNEL TO AMBIENT AT FINAL SEPARATION	N	II	108, 35.02									
11	RECEIVE REQUEST CLOSE PYRO BATTERY A&B CIRCUIT BREAKERS	N	III	108, 35.17									
12	CLOSE PYRO BATT A AND B CKT BREAKERS (EXCEPT HF ANT CB)	N	II	108, 35.20									
13	REPORT PYRO BATTERY A&B CIRCUIT BREAKERS CLOSED	N	III	108, 35.23									
14	INGRESS TO COUCH 2 FROM LOWER EQUIP BAY	N	III	108, 35.26									
15	CONNECT OXYGEN AND ELECTRICAL UMBILICALS	C	II	108, 37.50									
16	DISCONNECT CM ECS TRANSFER UMBILICAL FROM PGA	C	II	108, 38.20									
17	INGRESS TO COUCH 1 FROM LOWER EQUIP BAY	C	III	108, 38.30									
18	CHECK SPS CONTROLS AND DISPLAYS	C	III	108, 38.39					REFER TO PO-8				
19	PERFORM DISPLAYS CHECK OF SMC RCS	C	II	108, 38.54					REFER TO PO-7				
20	ORIENT FOR HI GAIN ANTEN POINT AND LEM JETT	C	II	108, 42.38									
21	ACTIVATE S BAND POWER AMP TO LOW POWER MODE	E	II	108, 46.05									
22	PERFORM ECS HOURLY INFLIGHT CHECK	E	II	108, 46.07					REFER TO PO-1				
23	PERFORM PERIODIC CHECK OF EPS	E	II	108, 46.31					REFER TO PO-2				

LUNAR ORBIT/LEM JETTISON (CONTINUED)

No.	Task	AMP/TF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Chil- dren	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	
24	PERFORM FINAL SEPARATION OF CSM/LEM	C	II	108.58.38							
25	DEACTIVATE ATTITUDE HOLD	C	II	108.58.38							
26	ACTIVATE SEQUENCER ARMING CIRCUIT	C	II	108.58.48				.9969			
27	ACTIVATE DOCKING PROBE EXTEND CIRCUIT	C	II	109.00.59				.9962			
28	MONT PYRO FIRE AND CSM/LEM FINAL SEP	C	III	109.00.56				.9964			

TRANS-EARTH INJECTION

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	Source	Rel	Source	
1	VERIFY SPS IGNITION	C, N	I	112.12.16	2.2	FIRE SPS ENGINE		.9999			
2	CHECK SPS ENGINE INJECTOR VALVE EVENT INDICATORS DURING ENGINE FIRING	E	II	112.12.16	2.3	CHECK INJECTOR VALVES		.9537			
3	MONITOR FDAI	C, N	II	112.12.16	2.6	CHECK S/C ATTITUDE		.9998			
4	MONITOR GPI	C	II	112.12.16	1.5	SET SPS GIMBAL ANGLES		.9666			
5	CHECK CMC FOR DELTA VELOCITY AND TIME FROM EVENT	N	II	112.12.16	1.1	INTERROGATE COMPUTER (ΔV & TIME)		.9942			
6	DETERMINE SPS CHAMBER PRESSURE NORMAL FROM EVENT	C	II	112.12.17				.9941			
7	CHECK SPS OXIDIZER AND FUEL QUANTITY DIGITAL INDICATORS AND UNBALANCE METER DURING ENGINE FIRING	E	II	112.12.18	2.4	CHECK FUEL & OXID PRESSURES		.9839			
8	CHECK CMC FOR DELTA VELOCITY AND TIME FROM EVENT	C	II	112.12.19	2.5	CHECK OXID-FUEL UNBALANCE					
9	CHECK SPS HELIUM PRESSURE CONTROL SUB-SYSTEM DURING ENGINE FIRING	E	II	112.12.20	1.1	INTERROGATE COMPUTER (ΔV & TIME)		.9942			
10	CHECK SPS PRESSURE AND TEMPERATURE PARAMETERS DURING ENGINE FIRING	E	II	112.12.21							
11	MANAGE SPS PROPELLANT UTILIZATION UNIT	E	II	112.12.26				.9904			
12	MONITOR DELTA VELOCITY REMAINING	C	II	112.12.26				.9882			
13	PREPARE FOR SPS CUTOFF	C	I	112.12.26	2.7	PERFORM THRUST OFF		.9925			
								.9957			
								.9974			

EARTH ENTRY							MARTIN STUDY TASKS							OTHER DATA			
No.	AMPTE DRIFT II TASKS			Crew Member	Criticality	Mission Time	No.	Task			Rel	A.I.R. Rel	Source	Rel	Source	Rel	Page Ref
1	MONITOR MDC CMC FOR COUNTDOWN TO .05 G			N	II	200.23.26						.9975					
2	MONITOR FDAI DISPLAY OF CM ATTITUDE, ATTITUDE ERROR AND ATTITUDE RATES			C	II	200.23.26						.9525					
3	MONITOR CAUTION AND WARNING DISPLAY PANEL			E	III	200.23.26						.9977					
4	COMMUNICATE ENTRY PHASE TIME TO CREW			N	III	200.24.06						.9991					
5	RECEIVE REPORT OF ENTRY PHASE TIME			C, E	III	200.24.06						.9999					
6	PREPARE DET FOR ENTRY RESTART			C	II	200.24.08						.9946					
7	MONITOR MDC CMC FOR TIME TO .05 G AND OTHER ENTRY PARAMETERS			N	II	200.24.08						.9955					
8	MONITOR CAUTION AND WARNING DISPLAY PANEL			E	III	200.24.08						.9977					
9	MONITOR FDAI DISPLAY OF CM ATTITUDE, ATTITUDE ERROR AND ATTITUDE RATES			C	II	200.24.10						.9525					
10	COMMUNICATE TIME TO .05 G			N	III	200.24.50						.9991					
11	RECEIVE REPORT OF TIME TO .05 G			C, E	III	200.24.50						.9999					
12	MONITOR MDC CMC FOR TIME TO .05 G AND OTHER ENTRY PARAMETERS			N	II	200.24.52						.9955					
13	MONITOR EMS FOR .05 G OCCURRENCE			C	II	200.24.52						.9990					
14	MONITOR CAUTION AND WARNING DISPLAY PANEL			E	III	200.24.52						.9977					
15	COMMUNICATE .05 G OCCURRENCE			C	III	200.25.32						.9991					
16	RECEIVE .05 G OCCURRENCE REPORT			N, E	III	200.25.32						.9999					
17	ACTIVATE SCS .05 G NODE			C	II	200.25.34						.9983					
18	ACTIVATE DET			N	II	200.25.34						.9983					
19	MONITOR CAUTION AND WARNING DISPLAY PANEL			E	III	200.25.34						.9977					
20	MONITOR FDAI THROUGH LIFT VECTOR MANEUVER			C	II	200.25.36						.9510					
21	MONITOR CMC DISPLAY OF ENTRY PARAMETERS			N	III	200.25.36						.9955					
22	CHECK EMS LIFT VECTOR COMMAND DISPLAY			C	II	200.39.26											
23	MONITOR CMC DISPLAY OF ENTRY PARAMETERS			N	III	200.39.26						.9955					

EARTH ENTRY (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref	
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	
24	MONITOR CAUTION AND WARNING DISPLAY PANEL	E	III	200.39.26				.9977				
25	COMMUNICATE CRITICAL ENTRY PARAMETERS	N	II	200.39.36				.9994				
26	RECEIVE REPORT OF CRITICAL ENTRY PARAMETERS	C,E	II	200.39.36				.9999				
27	MONITOR FDAI THROUGH LIFT VECTOR MANEUVER	C	II	200.39.38				.9510				
28	MONITOR CMC DISPLAY OF ENTRY PARAMETERS	N	III	200.39.40				.9955				
29	CHECK EMS DISPLAY OF ENTRY ON G/V SCROLL	C	III	200.39.48								
30	COMMUNICATE CRITICAL ENTRY PARAMETERS	N	II	200.39.58				.9994				
31	RECEIVE REPORT OF CRITICAL ENTRY PARAMETERS	C	II	200.39.58				.9969				
32	RECEIVE ALTITUDE REPORT	E	III	200.39.58				.9989				
33	CHECK EMS LIFT VECTOR COMMAND DISPLAY	C	III	200.40.00								
34	MONITOR CMC DISPLAY OF ENTRY PARAMETERS	N	III	200.40.00				.9955				
35	MONITOR EMS RANGE DISPLAY	C	III	200.40.10				.9968				
36	MONITOR CMC DISPLAY OF ALTITUDE	N	III	200.40.10				.9916				
37	COMMUNICATE ALTITUDE REPORT	N	III	200.40.20				.9994				
38	RECEIVE ALTITUDE REPORT	C	III	200.40.20				.9989				
39	MONITOR CAUTION AND WARNING DISPLAY PANEL	E	III	200.40.20				.9977				
40	CHECK EMS DISPLAY OF ENTRY ON G/V SCROLL	C	III	200.40.22								
41	MONITOR CMC DISPLAY OF ENTRY PARAMETERS	N	III	200.40.22				.9955				
42	MONITOR EMS RANGE DISPLAY	C	III	200.40.32				.9968				
43	MONITOR ALTIMETER	N	III	200.40.32	1.18	CHECK ALTIMETER ON	1.00	.9916				
44	COMMUNICATE ALTITUDE REPORT	N	III	200.40.42				.9994				
45	RECEIVE ALTITUDE REPORT	C	III	200.40.42				.9989				
46	MONITOR CAUTION AND WARNING DISPLAY PANEL	E	III	200.40.42				.9977				

EARTH ENTRY (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	Source	Rel	Source	
47	CHECK EMS DISPLAY OF ENTRY ON G/V SCROLL	C	III	200.40.44							
48	MONITOR CMC DISPLAY OF ENTRY PARAMETERS	N	III	200.40.44				* 9955			

PARACHUTE DESCENT

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA		
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Ref.	Source	Rel
1	TIGHTEN TORSO RESTRAINTS TO MAXIMUM CONSTRAINT	C	II	200.35.10						
2	TIGHTEN TORSO RESTRAINTS TO MAXIMUM CONSTRAINT	N	II	200.35.10						
3	TIGHTEN TORSO RESTRAINTS TO MAXIMUM CONSTRAINT	E	II	200.35.10						
4	ACTIVATE EARTH LANDING SYSTEM	C	II	200.35.31				.9967		
5	DETERMINE APEX COVER SEPARATION MECHANISM ACTIVATED	C	III	200.35.36				.9979		
6	DETERMINE APEX COVER JETT IPB NOT ILLUMINATED	C	III	200.35.38				.9979		
7	DETERMINE DEPLOYMENT OF DROGUE PARACHUTES. APEX COVER IS JETTISONED	C,N,E	II	200.35.43				.9999		
8	VERIFY DROGUE CHUTES DEREFFED	C,N,E	II	200.35.45				.9999		
9	TRANSMIT STATUS OF DESCENT PROGRESS TO MSFN	N	II	200.35.45				.9940		
10	DETERMINE PILOT PARACHUTE DEPLOYMENT MORTARS FIRED	C,N,E	II	200.36.40				.9999		
11	VISUALLY CHECK MAIN CHUTES DEPLOYED	C,N,E	II	200.36.40				.9999		
12	VISUALLY CHECK MAIN CHUTES REEfed	C,N,E	III	200.36.41				.9999		
13	TRANSMIT STATUS OF DESCENT PROGRESS TO MSFN	N	III	200.36.41				.9955		
14	ACTIVATE CM PROPELLANT JETT DUMP SYSTEM	C	II	200.36.41				.9984		
15	RESET DIGITAL EVENT TIMER	C	II	200.36.44				.9984		
16	CHECK EVENT TIMER RESET AND COUNTING	C	II	200.36.45				.9973		
17	DETERMINE FULL INFLATION OF MAIN PARACHUTES THROUGH WINDOW	C,E	II	200.36.49				.9999		
18	UNLOCK ALL COUCH ATTENUATOR STRUTS	C	II	200.36.59				.9984		
19	COMMUNICATE TO MSFN THAT MAIN CHUTES HAVE DISEEfed	E	III	200.36.59				.9985		
20	CHECK COUCH ATTENUATOR PINS UNLOCKED	C	III	200.37.02						
21	TRANSMIT STATUS OF DESCENT PROGRESS TO MSFN	N	III	200.37.04				.9985		

PARACHUTE DESCENT (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Time	A.I.R. Rel	Source	Ref	
22	ACTIVATE VHF RECOVERY BEACON	E	II	200.37.04							
23	CHECK COUCH ATTENUATOR PINS UNLOCKED	E	III	200.37.06							
24	ADJUST CONTROLLERS TO MINIMUM EXTENSION	C	II	200.37.07							
25	ADJUST CONTROLLERS TO MINIMUM EXTENSION	E	II	200.37.11							
26	RAISE COUCH 1 SEAT PAN FROM 96 DEG TO 66 DEG	C	II	200.37.22							
27	RAISE COUCH 3 SEAT PAN FROM 96 DEG TO 66 DEG	E	II	200.37.26							
28	CHECK VISUALLY TWO UPPER AND TWO LOWER ATTENUATION STRUT LOCK-OUTS HAVE UNLOCKED	N	III	200.37.35							
29	CHECK COUCH ATTENUATOR PINS UNLOCKED	N	III	200.37.35							
30	TIGHTEN TORSO RESTRAINTS TO MAXIMUM CONSTRAINT	E	II	200.37.35							
31	ADJUST CONTROLLERS TO MINIMUM EXTENSION	N	II	200.37.40							
32	RAISE COUCH 2 SEAT PAN TO 66 DEG FROM 96 DEG	N	II	200.37.55							
33	REPORT TO MSFN INITIATION OF CM PROPELLANT DUMP AND COUCH ATTENUATION STRUTS UNLOCKED	E	II	200.37.56							
34	TIGHTEN TORSO RESTRAINTS TO MAXIMUM CONSTRAINT	N	II	200.38.04							
35	CHECK COUCH ATTENUATOR PINS UNLOCKED	N	III	200.38.25							
36	ADJUST CONTROLLERS TO MINIMUM EXTENSION	N	II	200.38.30							
37	RAISE COUCH 2 SEAT PAN TO 66 DEG FROM 96 DEG	N	II	200.38.45							
38	SECURE ARMS FOR IMPACT, SYSTEMS ENGINEER	E	II	200.38.53							
39	SECURE ARMS FOR IMPACT, NAVIGATOR	N	II	200.39.09							
40	ACTIVATE CM RCS PROPELLANT JETTISON PURGE CIRCUITRY	C	II	200.39.24							
41	DEACTIVATE CM RCS PROPELLANT JETTISON LOGIC CIRCUITRY	C	II	200.39.27							

PARACHUTE DESCENT (CONTINUED)

ECS STATUS CHECK

No.	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
	Task	Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	
1	PERFORM ECS STATUS CHECK (NOTE: OCCURS WITH EPS, HOURLY WHEN POSSIBLE)	E	III										
2	CHECK CRYOGENIC OXYGEN SUPPLY NORMAL	E	III										
3	CHECK SURGE TANK PRESSURE NORMAL	E	III										
4	CHECK OXYGEN FLOW NORMAL	E	III										
5	CHECK PGA COMPRESSOR DELTA P NORMAL	E	III										
6	CHECK EVAPORATOR STEAM PRESSURE NORMAL	E	III										
7	CHECK GLYCOL DISCHARGE PRESSURE NORMAL	E	III										
8	CHECK WASTE WATER QUANTITY NORMAL	E	III										
9	CHECK POTABLE WATER QUANTITY NORMAL	E	III										
10	CHECK ECS RADIATORS OUTLET TEMPERATURE NORMAL	E	III			2.4	OPEN SPACE RADIATOR VALVES	.9846					
11	CHECK GLYCOL EVAPORATOR OUTLET TEMP NORMAL	E	III			2.5	CHECK GLYCOL EVAPORATOR TEMPERATURE	.9846					
12	CHECK PGA TEMPERATURE NORMAL	E	III										
13	CHECK CABIN TEMPERATURE NORMAL	E	III										
14	CHECK PGA PRESSURE NORMAL	E	III										
15	CHECK CABIN PRESSURE NORMAL	E	III										

No.	Task	AMPTF DRM II TASKS				EPS STATUS CHECK				MARTIN STUDY TASKS				OTHER DATA			
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Page Ref	Source	Rel	Source	Rel
	DETERMINE CRYO TANKS H ₂ AND O ₂ PRESS QUAN	E	II					.9834									
	DETERMINE FUEL CELL REACTANTS VALVES OPEN	E	II					.9946									
	DETERMINE FUEL CELL 1 FLOW AND TEMP READINGS pH STATUS REGULATOR OUTLET PRESSURES RADIATOR TEMP STATUS	E	II					.9712									
	DETERMINE FUEL CELL 2 FLOW AND TEMP READINGS pH STATUS REGULATOR OUTLET PRESSURES RADIATOR TEMP STATUS	E	II					.9712									
	DETERMINE FUEL CELL 3 FLOW AND TEMP READINGS pH STATUS REGULATOR OUTLET PRESSURE RADIATOR TEMP STATUS	E	II					.9712									
	DETERMINE FUEL CELLS CONNECTED TO DC BUSSES	E	II					.9892									
	DETERMINE DC VOLTAGE AND AMPERAGE PARAMETERS	E	II					.9733									
	DETERMINE AC VOLTAGE PARAMETERS	E	II					.9866									

ECS 12-HOUR SCHEDULED MAINTENANCE

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA			
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Page Ref
1	OBTAIN TOOL KIT FROM STORAGE	N	III										
2	INGRESS TO AREA OF ENVIRONMENT CONTROL UNIT	N	III										
3	PREPARE ATTENUATION PANEL FOR FILTER REPLACEMENT	N	III										
4	OPEN CO ₂ CANISTER AND REMOVE USED FILTER UNIT	N	III										
5	MANEUVER TO FILTER STORAGE BOX	N	III										
6	OPEN FILTER STORAGE BOX	N	III										
7	OBTAIN UNUSED FILTER ELEMENT FROM STORAGE	N	III										
8	STOW USED FILTER ELEMENT	N	III										
9	CLOSE FILTER STORAGE BOX	N	III										
10	INGRESS TO AREA OF ENVIRONMENTAL CONTROL UNIT	N	III										
11	INSTALL UNUSED FILTER ELEMENT	N	II										
12	REPLACE AND FASTEN PANEL	N	III										
13	RETURN TOOL KIT TO STORAGE	N	III										

EPS FUEL CELL PURGES							OTHER DATA					
No.	AMPTF DRM II TASKS			MARTIN STUDY TASKS			A.I.R. Rel	Source	Ref	Source	Ref	Page Ref
	Task	Crew Member	Criti- cality	Mission Time	No.	Task						
	<u>HYDROGEN PO-4</u>											
1	PERFORM FUEL CELL 1 H ₂ PURGE	E	II									
2	PERFORM FUEL CELL 2 H ₂ PURGE	E	II									
3	PERFORM FUEL CELL 3 H ₂ PURGE	E	II									
	<u>OXYGEN PO-5</u>											
1	PERFORM FUEL CELL 1 O ₂ PURGE	E	II									
2	PERFORM FUEL CELL 2 O ₂ PURGE	E	II									
3	PERFORM FUEL CELL 3 O ₂ PURGE	E	II									

VERIFY OPERATION STATUS OF CM UNPRESSURIZED RCS

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	
1	DETERMINE SUBSYSTEM A TEMP AND PRESS PARAM	N	II					.9949			
2	DETERMINE SUBSYSTEM B TEMP AND PRESS PARAM	N	II					.9949			
3	DETERMINE STATUS OF CM RCS He ISOLATION VALVES	N	II					.9964			
4	DETERMINE STATUS OF CM RCS PROP SHUTOFF VALVES	N	II					.9964			

DISPLAYS CHECK OF SM RCS

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Rel	
	ACTIVATE SM RCS PROPELLANT GAUGING UNIT	N	III		1, 5.1	SELECT S/M SUB SYST. FOR DISPLAY		.9956						
	DETERMINE SM RC SUBSYSTEM A TEMPERATURE AND PRESSURE PARAMETERS	N	II		1, 5.3	PRESSURIZE OXIDIZER AND FUEL TANKS (SYST's. A,B, C, &D)		.9948						
	DETERMINE SM RC SUBSYSTEM A PROPELLANT QUANTITIES	N	II		1, 5.3			.9981						
	ACTIVATE SM RC SUBSYSTEM B DISPLAYS	N	III		1, 5.3			.9955						
	DETERMINE SM RC SUBSYSTEM B TEMPERATURE AND PRESSURE PARAMETERS	N	II		1, 5.3			.9948						
	DETERMINE SM RC SUBSYSTEM B PROPELLANT QUANTITIES	N	II		1, 5.3			.9981						
	ACTIVATE SM RC SUBSYSTEM C DISPLAYS	N	III		1, 5.3			.9955						
	DETERMINE SM RC SUBSYSTEM C TEMPERATURE AND PRESSURE PARAMETERS	N	II		1, 5.3			.9948						
	DETERMINE SM RC SUBSYSTEM C PROPELLANT QUANTITIES	N	II		1, 5.3			.9981						
	ACTIVATE SM RC SUBSYSTEM D DISPLAYS	N	III		1, 5.3			.9955						
	DETERMINE SM RC SUBSYSTEM D TEMPERATURE AND PRESSURE PARAMETERS	N	II		1, 5.3			.9948						
	DETERMINE SM RC SUBSYSTEM D PROPELLANT QUANTITIES	N	II		1, 5.3			.9981						
	DEACTIVATE SM RCS PROPELLANT GAUGING UNIT	N	III					.9967						
	ACTIVATE SM RC SUBSYSTEM A DISPLAYS	N	III					.9971						
	DETERMINE POSITION OF SM RCS HELIUM ISOLATION AND PROPELLANT SHUTOFF VALVES	N	III					.9784						

CHECK SPS CONTROLS AND DISPLAYS						MARTIN STUDY TASKS						OTHER DATA			Page Ref
No.	Task	Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Rel	Rel	
	CHECK SPS PRESSURES AND TEMPERATURES	E	II					.9848							
	CHECK SPS ENGINE INJECTOR EVENT INDICATORS	E	II												
	CHECK SPS PROPELLANT GAGING SUBSYSTEM	E	II					.9976							
	CHECK SPS PROPELLANT UTILIZATION SUBSYSTEM	E	II					.9882							
	CHECK SPS HELIUM PRESSURE CONTROL SUBSYSTEM	E	II					.9964							

IMU ALIGNMENT

No.	Task	AMP TFF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	
1	COMMUNICATE BEGINNING OF IMU COARSE ALIGNMENT	N	III	NA				.9994			
2	OBTAIN IMU ALIGNMENT PROCEDURE	N	III								
3	OBTAIN TARGET STAR STARFIELD CHART	N	III								
4	SET G/N POWER OPTICS SWITCH TO ON	N	II								
5	MONITOR MDC CMC DURING PROGRAMMING	C	III								
6	CHECK CMC DSKY REGISTERS DISPLAY AS OCDUS GO TO ZERO	N	III								
7	CHECK SCT MECHANICAL COUNTERS READ ZERO	N	III								
8	PREPARE OPTICS SYSTEM CONTROLS	N	II								
9	COMMUNICATE REQUEST FOR CSM MANEUVER CONTROL	N	III								
10	RECEIVE REQUEST FOR CSM MANEUVER CONTROL FROM CREWMAN AT LEB	C	III								
11	MANIPULATE ATTITUDE IMPULSE CONTROLLER TO SCAN STARFIELD	N	III								
12	MONITOR DSKY DURING STAR SIGHTING	C	III								
13	PERFORM ACQUISITION AND IDENTIFICATION OF TARGET STAR	N	II								
14	ALIGN TARGET STAR IN SCT	N	II								
15	MARK ALIGNMENT OF TARGET STAR	N	II								
16	ENTER TARGET STAR IDENTIFICATION CODE INTO CMC	N	II								
17	PERFORM ACQUISITION AND IDENTIFICATION OF TARGET STAR	N	II								
18	ALIGN TARGET STAR IN SCT	N	II								
19	MARK ALIGNMENT OF TARGET STAR	N	II								
20	ENTER TARGET STAR IDENTIFICATION CODE INTO CMC	N	II								
21	MONITOR STAR DATA TEST (ANGLES WITHIN LIMITS)	C,N	III	NA				.9934			

IMU ALIGNMENT (CONTINUED)

No.	Task	AMP T/F DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	
22	CHECK DSKY NO ATTITUDE LIGHT IS ON	N	III	NA				.9944			
23	CHECK DSKY REGISTERS FOR DISPLAY OF ANGLES TO WHICH THE ICUDS WILL BE DRIVEN	N	II					.9968			
24	MONITOR AUTOMATIC G&N ATTITUDE MANEUVER AT MAIN DISPLAY CONSOLE	C	III					.9968			
25	CHECK DSKY AUTO LIGHT ON INDICATING ORIENTATION IS COMPLETE	N	III					.9944			
26	CHECK DSKY VERB INDICATOR, FLASHES V-, REQUEST GO AHEAD TO SIGHTING ORIENTATION	N	III					.9980			
27	PRESS DSKY ENTER PB INSTRUCTION CMC TO GO AHEAD WITH SIGHTING ORIENTATION MANEUVER	N	II			4.1.2 ENTER VERB AND NOUN		.9971			
28	CHECK DSKY REGISTERS FOR DISPLAY OF ANGLES AS THE ICUDS FOLLOW THE CSM MANEUVER	C,N	II					.9969			
29	CHECK DSKY VERB AND NOUN INDICATOR FLASH V-N- REQUESTING SWITCH TO COMPUTER OPTICS MODE	N	II					.9968			
30	MONITOR MDC CMC DURING IMU FINE ALIGNMENT	C	III					.9968			
31	SET OPTICS MODE SWITCH TO COMPUTER	N	II					.9960			
32	SET OPTICS TELESCOPE TRUNNION SWITCH TO SLAVE TO SEXTANT	N	II					.9960			
33	INSTRUCT CMC TO PROCEED BY PRESSING DSKY ENTER PUSHBUTTON	N	II				5.1	INTERROGATE COMPUTER FOR FINE ALIGNMENT AND SEQUENCE			
34	CHECK DSKY REGISTER 1 FOR SELECTED TARGET STAR CODE	N	III				4.3	CHECK STAR CODE			
35	CHECK DSKY REGISTERS DISPLAY THE REQUIRED SHAFT AND TRUNNION ANGLES TO ACQUIRE TARGET STARS	N	III								
36	CHECK SCT MECHANICAL COUNTERS ARE DRIVEN TO REQUIRED SHAFT AND TRUNNION ANGLES	N	III								
37	CHECK CMC VERB INDICATOR FLASH V-, PLEASE MARK	N	III	NA							

IMU ALIGNMENT (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	Source	Rel	Source	
38	SIGHT THROUGH SCT AND IDENTIFY TARGET STAR	N	III	NA	5, 8	SEARCH VIEWFIELD AND IDENTIFY FIRST STAR	.9987				
39	SET OPTICS MODE SWITCH TO MANUAL	N	II		5, 3	SELECT MANUAL OPTICS	.9960				
40	SET OPTICS COUPLING SWITCH TO RESOLVED	N	II		5, 8	SEARCH VIEWFIELD IDENTIFY STAR	.9986				
41	SIGHT THROUGH SCT AND CENTER STAR WITH OPTICS CONTROLLER	N	II		5, 9	CENTER STAR	.9982				
42	SIGHT THROUGH SEXTANT AND CENTER STAR WITH OPTICS CONTROLLER	N	II		5, 9	CENTER STAR	.9999				
43	MARK CENTERING OF STAR IN SEXTANT	N	II		5, 9	CENTER STAR	.9982				
44	CHECK DSKY VERB AND NOUN INDICATOR FLASH V-N-, ENTER STAR IDENTIFICATION CODE	N	III		5, 9	CENTER STAR	.9968				
45	ENTER TARGET STAR ID CODE INTO CMC	N	II		5, 9	CENTER STAR	.9934				
46	CHECK DSKY VERB AND NOUN INDICATOR FLASH V-N- REQUESTING SWITCH TO COMPUTER OPTICS MODE	N	III		5, 9	CENTER STAR	.9968				
47	SET OPTICS MODE SWITCH TO COMPUTER	N	II		5, 9	CENTER STAR	.9960				
48	SET OPTICS TELESCOPE TRUNNION SWITCH TO SLAVE TO SEXTANT	N	II		5, 9	CENTER STAR	.9934				
49	INSTRUCT CMC TO PROCEED BY PRESSING DSKY ENTER PUSHBUTTON	N	II		5, 9	CENTER STAR	.9960				
50	CHECK DSky REGISTER 1 FOR SELECTED TARGET STAR CODE	N	III		5, 9	CENTER STAR	.9968				
51	CHECK DSky REGISTERS DISPLAY THE REQUIRED SHAFT AND TRUNNION ANGLES TO ACQUIRE TARGET STARS	N	III		5, 9	CENTER STAR	.9968				
52	CHECK SCT MECHANICAL COUNTERS ARE DRIVEN TO REQUIRED SHAFT AND TRUNNION ANGLES	N	III		5, 9	CENTER STAR	.9966				
53	CHECK CMC VERB INDICATOR FLASH V-, PLEASE MARK	N	III		5, 10	SEARCH VIEWFIELD AND IDENTIFY FIRST STAR	.9980				
54	SIGHT THROUGH SCT AND IDENTIFY TARGET STAR	N	II		5, 10	SEARCH VIEWFIELD AND IDENTIFY FIRST STAR	.9987				
55	SET OPTICS MODE SWITCH TO MANUAL	N	II		5, 10	SEARCH VIEWFIELD AND IDENTIFY FIRST STAR	.9960				
56	SET OPTICS COUPLING SWITCH TO RESOLVED	N	II		5, 10	SEARCH VIEWFIELD AND IDENTIFY FIRST STAR	.9986				
57	SIGHT THROUGH SCT AND CENTER STAR WITH OPTICS CONTROLLER	N	II	NA	5, 10	SEARCH VIEWFIELD AND IDENTIFY FIRST STAR	.9982				

IMU ALIGNMENT (CONTINUED)

No.	Task	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	Rel	
58	SIGHT THROUGH SEXTANT AND CENTER STAR WITH OPTICS CONTROLLER	N	II	NA	5.11	CENTER STAR		.9999						
59	MARK CENTERING OF STAR IN SEXTANT	N	II		5.11	CENTER STAR		.9982						
60	CHECK DSKY VERB AND NOUN INDICATORS FLASH V-N, ENTER STAR IDENTIFICATION CODE	N	III					.9968						
61	ENTER TARGET STAR IDENTIFICATION CODE INTO CMC	N	II					.9934						
62	MONITOR STAR DATA TEST (ANGLES WITHIN LIMITS)	C, N	III					.9968						
63	CHECK DSKY REGISTERS AS ICDUS CHANGE AS CMC TORQUES PLATFORM	N	III					.9968						
64	MONITOR MDC CMC DURING IMU FINE ALIGNMENT	C	III					.9999						
65	CHECK DSKY VERB AND NOUN INDICATORS FLASH V-N PLEASE PERFORM FINE ALIGNMENT	C, N	III					.9968						
66	REPEAT STEP NOS 31-62		II											
67	CHECK DSKY REGISTERS DISPLAY OF PRESENT CDU GIMBAL ANGLES	C, N	III											
68	CHECK DSKY REGISTERS DISPLAY AND FLASH DESIRED FINAL CDU GIMBAL ANGLES	C, N	III											
69	ENTER VERB-, PROCEED INTO DSKY INSTRUCTING CMC TO PROCEED WITH FINAL ATTITUDE MANEUVER	N	II											
70	CHECK ENTRY OF PROCEEDED INSTRUCTION	C	III											
71	CHECK DSKY REGISTERS STOP FLASHING BUT DISPLAYS CDU GIMBAL ANGLES	C, N	III											
72	CHECK TERMINATION OF DSKY DISPLAY OF CDU GIMBAL ANGLES, INDICATING COMPLETION OF MANEUVER	C, N	III											
73	CHECK CONTROL/DISPLAY STATUS	C	III											
74	REMOVE ROTATIONAL CONTROLLER NO. 2 FROM LEB	N	II											

MU ALIGNMENT (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	
75	INSTALL ROTATIONAL CONTROLLER AT RIGHT HAND COUCH	N	III	NA							
76	STORE LEB DATA SOURCE AND STAR CHARTS	N	III								
77	SET G&N POWER OPTICS SWITCH TO OFF	N	II		6.3	REMOVE G/N OPTICS POWER	.9985				
78	DEACTIVATE LEB ILLUMINATION	N	II	NA							

STAR-LANDMARK NAVIGATION SIGHTING

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R Rel	Source	Rel	
1	COMMUNICATE BEGINNING OF LANDMARK STAR NAVIGATION SIGHTING	N	III					.9994			
2	OBTAIN STAR LANDMARK NAVIGATION PROCEDURE	N	III					.9989			
3	SELECT STAR LANDMARK OR HORIZON SIGHTING MAJOR MODE	N	II								
4	PROGRAM CMC	N	II					.9934			
5	MONITOR CMC	C	III					.9968			
6	SET G/N POWER OPTICS SWITCH TO ON	N	II					.9986			
7	CHECK CMC DSKY REGISTERS DISPLAY AS OCDUS GO TO ZERO	N	III					.9968			
8	CHECK SCT MECHANICAL COUNTERS READ ZERO	N	III					.9966			
9	PREPARE OPTICS SYSTEM CONTROLS	N	II					.9833			
10	RECEIVE REQUEST FOR CSM MANEUVER CONTROL	C	II					.9989			
11	SELECT CMC FREE MODE	C	II					.9960			
12	REQUEST CSM CONTROL	N	II					.9994			
13	PREPARE ROTATIONAL CONTROLLER	N	II								
14	CHECK DSKY VERB AND NOUN INDICATORS FOR DISPLAY OF LANDMARK CODE	N	III					.9968			
15	CHECK DSKY REGISTERS FOR DISPLAY OF LANDMARK LATITUDE, LONGITUDE AND TIME TO ACQUISITION	N	III					.9934			
16	MONITOR CMC	C	III					.9968			
17	SET TTE CLOCK FOR LANDMARK ACQUISITION TIME	N	II					.9984			
18	SELECT AND STUDY LANDMARK CHART	N	III								
19	OBTAIN TARGET STAR STARFIELD CHART	N	III								
20	SELECT TARGET STARS	N	II								
21	ACQUIRE AND CENTER LANDMARK TARGET IN SCT	N	II								
22	ALIGN LANDMARK IN SXT	N	II								
23	ACQUIRE TARGET STAR IN SCT	N	II								

STAR-LANDMARK NAVIGATION SIGHTING (CONTINUED)

No.	Task	AMPTF DRM II TASKS			MARTIN STUDY TASKS			OTHER DATA			Page Ref
		Crew Member	Criticality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	
24	ALIGN TARGET STAR TO SXT R RETICLE LINE	N	II					.9999			
25	CHECK SXT ACQUISITION OF TARGET STAR	N	III					.9987			
26	ALIGN TARGET STAR TO SXT R RETICLE LINE	N	II					.9999			
27	ALIGN LANDMARK TARGET AND TARGET STAR ON SXT R RETICLE LINE	N	II					.9999			
28	CHECK CMC VERB INDICATOR FLASH V-, PLEASE MARK	N	III					.9980			
29	MARK ALIGNMENT OF LANDMARK TARGET AND TARGET STAR	N	II					.9982			
30	CHECK DSKY VERB AND NOUN INDICATOR FLASH V-N, ENTER STAR IDENTIFICATION CODE	N	II					.9968			
31	ENTER TARGET STAR IDENTIFICATION CODE INTO CMC	N	II					.9934			
32	CHECK DSKY VERB AND NOUN FLASH V-N, REQUESTING LOAD LANDMARK DATA	N	III					.9968			
33	ENTER LANDMARK IDENTIFICATION CODE, LATITUDE AND LONGITUDE	N	II					.9934			
34	PRESS DSKY "ENTER" PUSHBUTTON	N	II					.9934			
35	CHECK DSKY REGISTER 1 FOR SXT SHAFT ANGLE	N	III					.9968			
36	CHECK DSKY REGISTER 2 FOR SXT TRUNION ANGLE	N	III					.9968			
37	CHECK DSKY REGISTER 3 FOR TIME OF MARK	N	II					.9968			
38	CHECK DSKY REGISTER 3 FOR TIME OF MARK	N	III					.9968			

LUNAR LANDMARK SIGHTING

No.	AMPTF DRM II TASKS				MARTIN STUDY TASKS				OTHER DATA				Page Ref
	Task	Crew Member	Critic- ality	Mission Time	No.	Task	Rel	A.I.R. Rel	Source	Rel	Source	Rel	
1	CK DSKY V&N INDICATORS FOR DISPLAY OF CODE	N	III					.9968					
2	CK DSKY FOR LANDMARK LAT, LONG AND ACQUISITION TIME	N	III					.9934					
3	SET TTE CLOCK FOR LANDMARK ACQUISITION TIME	N	II					.9984					
4	SELECT AND STUDY LANDMARK CHART	N	III					.9988					
5	CK DSKY FOR REQUIRED SHAFT AND TRUN ANG TO TARGET	N	III					.9988					
6	CK SCT MECH COUNTER FOR REQUIRED SHAFT AND TRUN ANGLE	N	III					.9966					
7	SIGHT THRU SXT AND MONITOR ACQUIS OF LANDMARK	N	II					.9939					
8	CHECK CMC VERB INDICATOR FLASH V-, PLEASE MARK	N	III					.9980					
9	SET OPTICS MODE SWITCH TO MANUAL	N	II					.9960					
10	SET OPTICS COUPLING SWITCH TO RESOLVED OPTICS CONTROL	N	II					.9986					
11	SIGHT THRU SXT AND CENTER LANDMARK/W/ OPTICS CONTROL	N	II					.9939					
12	MARK CENTERING OF LANDMARK	N	II					.9982					
13	CHECK DSKY V&N FLASH V-N-REQUESTING LOAD DATA	N	III					.9968					
14	ENTER LANDMARK ID CODE, LAT AND LONG	N	II					.9934					
15	PRESS DSKY ENTER PUSHBUTTON	N	II					.9934					